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Galaxy

MAGAZINE OF

SCIENCE FICTION

Theodore Sturgeon

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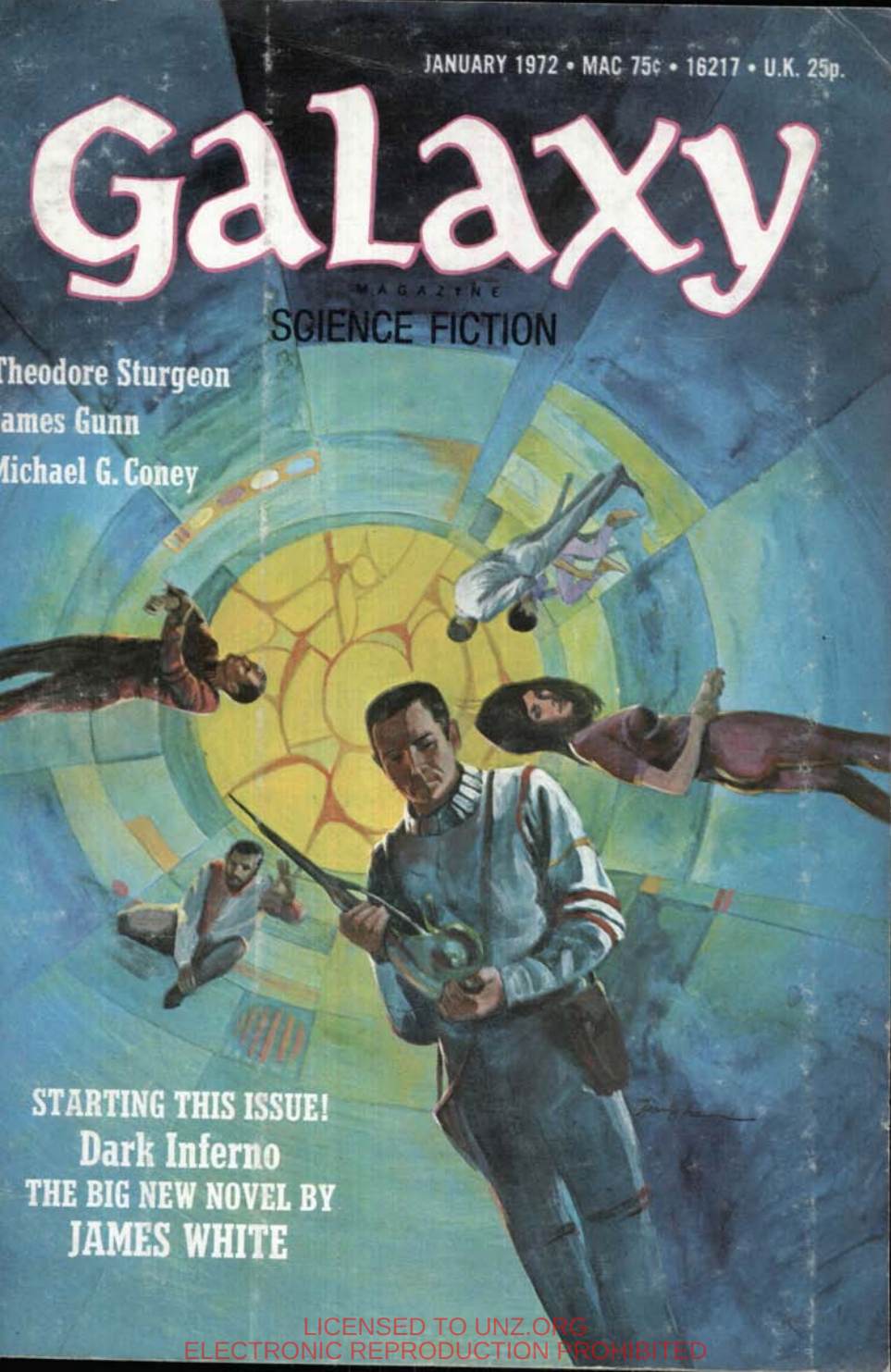

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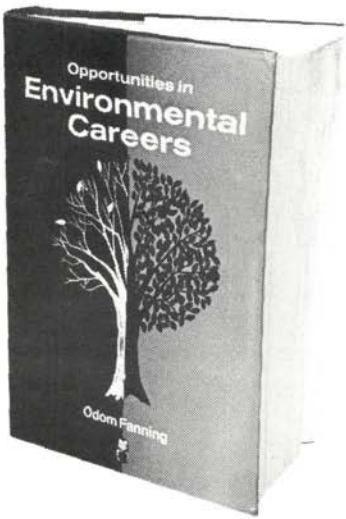

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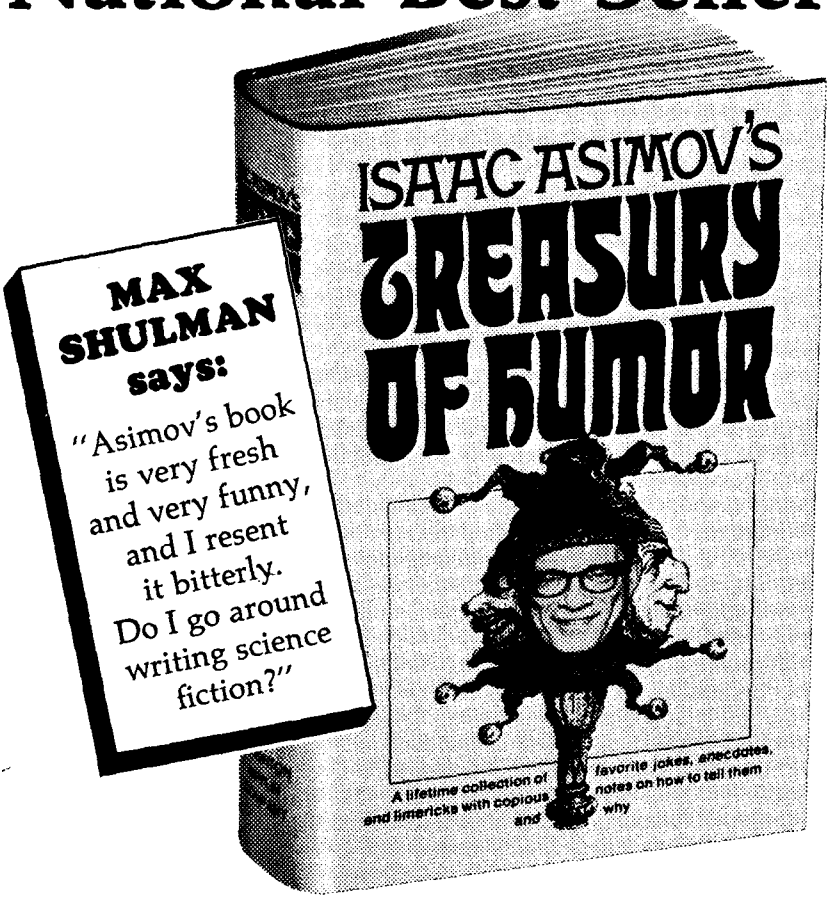
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Galaxy
SCIENCE FICTION

MAGAZINE

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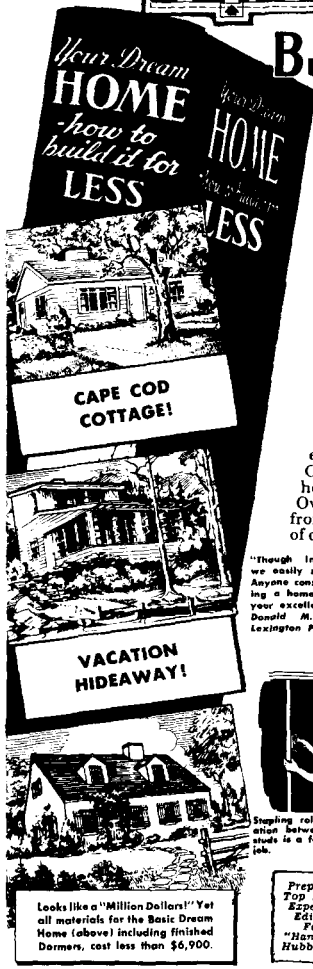

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EDITOR'S PAGE

One day I am going to sit down and count all the reference points to science fiction, past and present, with which Algis Budrys has provided *Galaxy* readers—and myself—in *Galaxy Bookshelf*. I am going to do so just to enjoy again the unique illumination in which he has bathed the scene for me and thousands of others. Even more impressive than the sheer voluminousness of "Ajay's" reading has always been its quality. The best of books can be read badly—and bad books almost invariably are—but never by Budrys.

The light has been steady.

Ajay dropped his bombshell at the end of his last column (*Galaxy*, November '71). For the time being he wants to read science fiction for pleasure, not as a chore, and will write no more reviews for *Galaxy*. And the light over *Galaxy Bookshelf* flickered out.

It comes on again in this issue, with Theodore Sturgeon taking over the *Bookshelf*. I think you will find the new light rich, warm and brilliant—and at least as uniquely compelling as the old.

It is powered by a depth of intellect and understanding unsurpassed—perhaps even unmatched—in the field and to which no one who reads this will need an introduction.

• Many of you noted with dismay, some with chagrin, that A. Bertram Chandler's *Sister Ships* (*Galaxy*, Sept./Oct. '71) had appeared a month earlier (our issue hit the newsstands in July) in an Ace anthology. The accident was like all others in that it should not have happened, yet was unavoidable.

Sister Ships had been scheduled and actually set in type for April publication in *Galaxy*. Then came the hike in our production costs that squeezed *Galaxy* into bimonthly publication and *Worlds of Tomorrow* and *Worlds of Fantasy* into suspension. Schedules and inventories had to be reshuffled and *Sister Ships* sat on her pad, in type and ready for liftoff. September/October *Galaxy* provided the first new schedule opening for the story.

Through some communications snafu I had not been made aware in advance of the Ace publication date. By the time their anthology reached stands it was too late to pull *Sister Ships* out of *Galaxy* without destroying the entire issue—it was in the final press stages.

A substantial percentage of stories first published in *Galaxy* and *If* are subsequently anthologized, as *Sister Ships* was originally scheduled to be. Seven out of fifteen stories selected by Don Wollheim and Terry Carr for Ace Books' *World's Best Science Fiction: 1971* came from the *Galaxy* group magazines.

This is all to the good—and any time you want to write on stone that the *Galaxy* people loved the Ace people in 1971—why, go ahead. You would be right.

—JAKOBSSON

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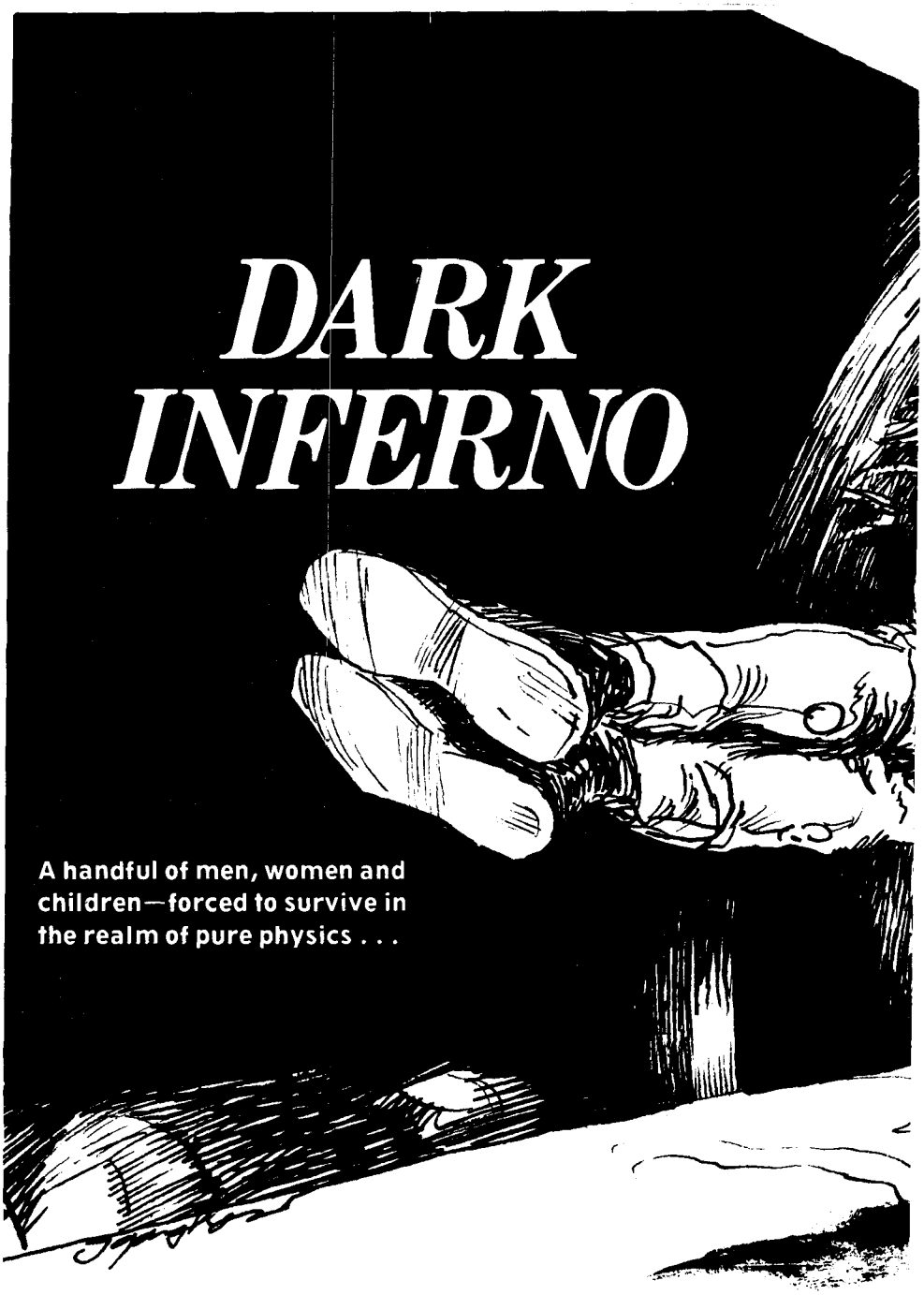

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I

THE departure lounge was half full after the coach had left on its first trip to the ship, but it had not grown any quieter. Excitement, impatience and natural anxiety had combined to raise the noise level of every conversation until the background music and its intended soothing effect were obliterated. Ignoring the low and sinfully soft couches scattered around the large, cool room, the remaining passengers for *Eurydice* clustered about the exit ramp like jet travelers bucking for a seat by a window.

No one was paying attention to Mercer directly. Relieved, he dropped his eyes to the papers he had not been studying for the past half an hour and wondered if he replaced them in his briefcase would the act be the signal for the passengers to come surging over to introduce themselves or ask questions. He already knew all of their names, having memorized the passenger list, and his job largely consisted of looking after them. But right now they were still strangers—for the simple reason that he did not know which face went with any given name, so he decided to savor his last remaining moments of introversion before he had to join the ship.

But no sooner had Mercer made this decision and begun to feel pleasantly guilty about it than a pair of small feet moved into the area of floor covered by his downcast eyes and stopped a few yards in front of his chair. He looked up.

Black sneakers, black slacks, black tunic and long-visored cap which carried an improbable quantity of insignia and plastic scrambled eggs. The uniform had probably been a good fit last Christmas, but now it was a little short and tight. Even though the body overfilling the uniform was sturdy and well-nourished, the face had the pinched, big-eyed look of the overly imaginative, intelligent and probably highly nervous child. Mercer did not have to read the identity patch on the boy's chest to know that this was Robert Mathewson—there was only one ten-year-old boy on the passenger list.

He and the boy stared at each other for a long time, Mercer feeling as tongue-tied as the boy looked. The sensation was ridiculous, he told himself irritably as the silence began to drag and both their faces shifted deeper into the infrared. This was, after all, his first social contact with a passenger and one this young should be easy—good practice for him, in fact.

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Clearing his throat, he said, "I didn't know that we had been assigned a cadet for this trip, but I can certainly use your help—"

"Bobby, I told you not to wander off," said a voice from behind him. It was feminine, harassed and belonged, Mercer saw as he turned, to the boy's mother. She was young, dark-haired, with a face subtly distorted by tension and worry so that he could not decide whether she was pretty or downright lovely. She rushed on: "You were told not to talk to strangers and that means not making a nuisance of yourself to the ship's officers. I'm sorry about this, sir. You're obviously busy and he knows better than to—"

"It's quite all right, ma'am," began Mercer, but already she was dragging her son toward the largest group of passengers, still scolding and apologizing and not listening to him at all.

For a few minutes he watched the boy in the space officer's outfit and the mother in the issue coveralls the passengers wore shipside. The one-piece garb was not exactly shapeless—especially not on Mrs. Mathewson—but it conformed to the dictates of the current neo-puritan fashion, which insisted on covering the female form on public occasions from neck to ankles.

Suddenly restless, Mercer stuffed the papers back into his briefcase and stood up. He began pacing slowly around the empty end of the lounge, staring at the large, full-color pictures closely spaced along the walls so that he would not have to look at—and perhaps become involved with—the passengers. His first contact with two of them had not exactly helped his self-confidence.

Like the background music the pictures were designed to be reassuring—there was only one takeoff. A few interior shots and the rest showed *Eurydice* or her sister ships coming in to land beneath enormous, brightly colored dirigible parachutes or floating in the ten-miles-distant landing lake and held upright by a collar of inflated life pods while the passengers slid laughing down a transparent tube into a waiting boat. The pictures stressed the Happy Return rather than the Voyage itself, Mercer thought synically as he moved to the big periscopic window that looked out over the field.

TWO miles away *Eurydice* stood by her gantry, clean but for the passenger boarding bridge. Only the topmost hundred feet or so of the ship proper—comprising the control room, crew quarters and

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the upper members of the structure that supported the rotating section—were visible. The service and life-support modules, water tank and nuclear power unit were wrapped in boosters. A mile farther down the line stood the empty gantry that had serviced *Minerva* before her departure four months earlier and beyond that, rippling faintly in the heat, rose a ship identical to *Eurydice* except for its much larger and more complex wrapping of boosters.

Nobody talked about that particular ship and it did not have a name. Like the homecoming pictures scattered around the lounge it was meant to be a reassuring sight, but somehow it was nothing of the kind.

The only difference between the passengers and himself, Mercer thought sourly, was that he had nobody to talk loudly and nervously to.

"*Eurydice*, sir?"

He turned to find a hostess standing behind him. She was wearing one of the old-style mirror plastic uniforms—described as pseudo-futuristic by female fashion writers and with animal growls of appreciation by men regardless of occupation—and for the first few seconds that was all he saw. He was vaguely aware of glittering boots, a hat streamlined for mach three and short cloak thrown back over shoulders that were a flawless, creamy pink—and intensely aware of the rest of the getup which was virtually topless and all but bottomless. When he finally raised his eyes Mercer discovered that she was not just a beautiful body—she had a nice face, too.

"The coach is waiting, sir," she said. Her smile was polite and not at all impatient and her eyes were laughing at him.

Mercer nodded and began walking briskly toward the exit where the passengers were already climbing the ramp that led from the cool, blast-proof lounge to the blistering heat of the surface one hundred feet above. She hurried to keep pace with him and Mercer wondered why until he realized suddenly that they were, after all, fellow workers, servants of the same company, colleagues. The realization made it possible for him to untie his suddenly knotted tongue.

"I'm sorry if I appeared rude back there," he said, trying hard to keep his eyes on a level with her face, "but it seems to me that, to anyone leaving Earth perhaps never to return, you make a very nice last impression. In fact, if there were a little more time be-

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fore takeoff it would not take much to convince me not to leave at all. Or come to think of it, when I get back in eight months we could meet and maybe—"

"What you are thinking would probably get us both into trouble with my husband," she broke in, laughing. "This is your first trip."

It was a statement with not the slightest suggestion of a question mark tacked onto the end.

Trying to hide his irritation, Mercer said, "I didn't think it showed."

She was silent while they left the lounge and began to mount the flat spiral ramp leading to the surface. Radiation doors interrupted the ascending tunnel every twenty yards and had been dogged open so that the hot, dusty air from above was already reaching down. When she spoke, the last of the passengers were out of sight and hearing, hidden by the curve of the tunnel and their own self-generated wall of sound.

"It shows, sir," she said seriously. "But I'm learning caution in my old age. You see, I don't seem to be able to give advice without also giving offense. So unless I'm asked—"

"I'm asking," said Mercer dryly.

SHE nodded. "All right. You are the tall, hungry-looking type who suits that black rig—but you, especially, must be careful how you wear it. That rakish angle of the hat is wrong for *Eurydice* and some of your pocket zips are done and some half-done—you haven't got that right, either, and at this stage of the game you shouldn't even try. Even the plays you have been watching so carefully on TV never get it right, so don't feel too bad about it."

Mercer said nothing.

"This mystique with the zips and caps that veteran spacemen practice," she went on, "began as sheer sloppiness, no doubt, but now the so-and-so's change the rules after every trip just to confuse people. But you, sir, are not yet a veteran, so it is much better that you don't get it at all than get it wrong. In any case, there are two officers on every ship who do not subscribe to these little idiosyncrasies of dress. They are the captain, who is too important to care about such things and the other is you, sir, who are generally considered to be the lowest form of life in the service and not supposed to get ideas above your station. But you know all this already, I hope."

She was watching him intently, but she relaxed when he smiled and said, "I was told, but not precisely in those words. The general idea seems to be that—since our

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passengers have to be physically fit to be allowed to make the trip in the first place—my medical know-how is not essential and, since I have no other specialized technical training useful in space, my duties will be largely those of a steward. The responsibility for ensuring that the customers have a happy and confortable trip is mine, apparently, and until now, I'm sorry to say, the thought of mixing with and looking after more than forty healthy people has me scared stiff."

"You are being too negative, sir," she told him sharply. "You may be little more than the ship's steward, but you must not act like one or even think like one. And you apologized to me twice during, oh, five minutes of conversation. That's bad. You must be the strong, silent type if you want to gain the respect of your charges. Failing that you can be the weak, silent type—just as long as you're silent, reserved, somewhat aloof at all times and never tell them your troubles. Remember that the passengers don't know that you are just a glorified steward and they must never suspect that you are their servant or your first trip will be hell—and your last as far as *Eurydice* is concerned. Because if even once you have to go to the real officers with a passenger problem your name is mud and you'll never—"

She was beginning to sound rather emotional, Mercer thought. He held up his hand and said, "What did I ever do to you?"

She was quiet for the next dozen paces. Then she laughed and said, "Not a thing. But you can return my favor if you like. I would like to have a few extra minutes on board. If I could stay up there with the first group of passengers while you took up the second batch—I really would appreciate that, sir."

Return what favor? Mercer wondered, then thought that her advice and criticism had been just that even if it had nearly lifted the skin off his back. He nodded.

"Thank you, sir."

Definitely the emotional type, he thought.

A few minutes later they reached the upper end of the ramp and stood blinking in the twin glare of the afternoon sun and the mirror-bright coach. His dark uniform soaked up the heat like a thermal sponge and beside him the girl became a glittering, truncated cone as she pulled the cloak around her shoulders.

"Sorry to spoil your view," she said, "but I don't tan in the sun—I frizzle up. You take the seat beside mine at the rear—you'll have more leg room—and ignore the

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flashing lights on my call panel. People always sit on the arm-rest buttons while finding a seat. Be with you in a minute, sir."

Mercer smiled.

By the time she rejoined him he had used the cosmetic mirror set into her service panel to adjust his cap, which was now absolutely straight and as level as the distant blue line of the landing lake. He had also checked his zips. The coach was already picking up speed towards *Eurydice's* gantry and the noise level was keeping pace with it. Two seats in front of Mercer a man was complaining bitterly because the coaches were not big enough to move everyone to the ship at the same time. Another was insisting that at the price this trip was costing his company he was damn well going to watch the takeoff from a port and from farther along the coach two different call lights were blinking in tandem.

"It's high time," said Mercer, rising, "that I started getting to know my patients—I mean passengers."

Her small, strong hand pushed him back into the seat.

"I'll handle it," she said. "Until they are all trussed up and safe in their acceleration couches they are my responsibility. Sit there and save your strength."

II

BECAUSE it was a widely accepted fact that many people could undertake plane trips and even interplanetary voyages without qualms and yet be scared silly by three hundred feet of altitude, the elevator that took *Eurydice's* passengers up to the main entry lock was completely enclosed. But that low-ceilinged, windowless cage had a subduing effect, Mercer noted. It was as if the passengers realized that they were taking their first tiny step spaceward and that there was still time to step back. Or was he simply putting thoughts into the passengers' minds because the same thoughts were going through his own?

The cage was uncomfortably crowded, but the passengers were somehow managing to keep their distances from each other and did not even look at him. Starting to introduce himself under these conditions was impossible—he would simply make himself look and sound ridiculous. But he could at least nod at young Mathewson without loss of dignity or doing irreparable harm to his image.

But the boy tried to salute him and jabbed a passenger in the stomach with his elbow. His mother grabbed his arm and began apologizing all around and

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Mercer retreated behind his personal wall of silence wondering, as they reached the top and the passengers preceded him into the ship, if it were possible to project an image so strong and silent that he would not have to speak to anyone at all for the entire four months of the trip.

First Officer Prescott was waiting just inside the outer seal. He ran his eyes quickly from Mercer's cap to his footwear and back again, looking faintly surprised, but when Prescott spoke he sounded more than faintly disappointed.

"I thought you weren't going to make it. What kept you?"

"I was told to come aboard with the last coachload of passengers—" began Mercer. But Prescott was obviously not listening, so he concentrated on being strong and silent again as he passed into the lock antechamber. He could feel his face burning, so the chances were that he was fooling nobody but himself.

The captain was standing just inside the seal, looking cool, correct and with his features, if anything, stiffer than his erect body. He was looking through Mercer and the double hull behind him at some remembered object or event that claimed all of his attention.

Mercer had met Collingwood and the other officers briefly during his training and the captain had been the only one who had not made him feel like crawling under the nearest stone. But now it looked as if Collingwood were angry about something, probably the misdemeanour of the girl's having deserted most of a coachload of passengers. Perhaps one of them had actually complained to him about it and now she was standing beside the captain, looking about to cry.

Mercer felt sorry for her. She was easy to like and even easier to feel sorry for and in a way he was responsible for her trouble because he had agreed to her request. He wanted badly to apologize, but remembered that she did not like people who apologized too often. He stopped. The captain was still staring into the middle distance, not even seeing him.

"Good-bye, ma'am," Mercer said.

It came close to being the shortest and most uninspired farewell of all time, but her reaction literally rocked him back on his heels.

"Take care of yourself," she said, standing on tiptoe and giving him a warm but sisterly kiss on the cheek. Then she looked at him seriously and added: "Take care of all of them, sir."

Mercer had instinctively put his

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arms around her waist, both to keep his balance and because it seemed to be the thing to do, then let them drop to his sides. She had not, he saw, committed some trifling misdemeanour and been told off for it—there was far too much tension and sheer misery in her expression. He wondered what kind of trouble could make a girl with a disposition like hers react like this—and if he could help. But today he seemed to have left his inspiration in his other suit and all he could manage was a sickly smile and a line of trite dialogue.

"What about your husband, ma'am?"

"He doesn't mind," said the captain, "provided you two don't make a habit of it." Suddenly he laughed and the girl began laughing, too—the way people did who were trying hard not to cry. She turned from Mercer to hang a stranglehold on the captain's neck. The kiss she gave him was anything but sisterly.

Mercer was still staring at them when Prescott's finger dented his shoulder.

"Are you some kind of voyeur, Mercer? We have work to do upstairs."

"Yes, sir."

BUT when they had climbed to the passenger level Prescott paused for a few moments before continuing toward the control deck. Pitching his voice low because of the passengers lying all around them, he said, "They're all yours, Mercer. Keep them quiet and comfortable and don't let anyone be sick outside of his plastic bag—that is funny only on television. If you should have a problem, hesitate before calling on me for help—hesitate for as long as possible because we will be very busy and will not take kindly to doing your job for you. Understood?"

"Yes, sir."

Prescott shook his head. "You have made a great start to your first voyage, Mercer, and I shudder to think of what you might do before it ends. I mean, practically making love to the captain's wife before his very eyes—"

"At the risk of sounding a cad, sir," said Mercer, "she started it."

"And another thing, Mercer. We do not salute or click heels or call anyone 'sir' except the captain—and he does not insist on it. Invisible discipline is what we aim for and an air of relaxed informality—well, informality anyway. Just look after your passengers without getting too close to any of them and keep out of the way of the ship's officers—"

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"It looks as if I'll have a very lonely trip, Mr. Prescott," said Mercer quietly, but he was unable to keep the anger from showing in his tone.

"In my experience," Prescott replied in a voice that was sarcastic rather than actively hostile, "people like you take a trip like this as a means to an end. In your profession space experience automatically puts you at the head of the queue as far as the juiciest research appointments are concerned and even in private practice it is enough to allow you to triple your fees. Perhaps we will be lucky—you will stay out of trouble with the passengers, keep yourself to yourself and spend your free time in your cabin studying some of those books you brought along."

"You'll be lucky."

Prescott ignored both the anger and the ambiguity in Mercer's reply.

He said, "I hope so. But you are going to have company in a moment and I haven't time to chat, even to overexposed ministering angels. See you."

Mercer turned as the first officer continued his climb to the cone. The two hostesses who had been checking and strapping in the passengers on arrival were only a little overexposed and neither could hold a candle to Mrs. Captain. Or maybe it was just that his artistic appreciation had been deadened by the recent exchange with Prescott. He nodded, uncomfortably aware that his face was still red.

"The passengers are settled in, sir," said the dark-haired one. "All have been given medication, but you might keep an eye on Mr. Saddler and Mr. Stone, who may be trying to prove something—I think they palmed their capsules."

Mercer nodded without speaking.

"Don't let Prescott bother you, sir," said the blond one, reading his expression if not his mind. "He is an exceptionally good officer, believe it or not, even if he does lack charm."

"Surely," said Mercer, "you aren't his mother?"

The girl laughed. "No, and nobody said anyone loves him. But we have to go now and separate the Collingwoods—the boarding gantry swings in inside five minutes. Good luck, sir."

"And good hunting," added the other.

When they had gone Mercer stood for a moment looking slowly around the passenger deck, feeling lonely despite being knee deep in a wall-to-wall carpet of people, most of whom were staring at him. *This is just like the*

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simulator, he told himself firmly, *complete with ship noises, muted countdown from the wall speakers, the paint and plastic smell of the acceleration couches and the pressure of cool, artificially fresh air on my face*—exactly the same, except that the couches were not being occupied by bored junior clerks from the administration building next door and the sounds and smells were real.

His job now was to give real comfort and reassurance to his charges, not just the simulated kind.

According to the instruction book and the psychologist who had taken him through it, the job was simple. At this stage the passengers were already wrapped in broad acceleration webbing—even the shape of the couches was reminiscent of a cradle and the calm, competent figure of a ship's officer moving among them was a father figure tucking them in for the night. Greeting them individually by name, making a perfunctory check on the tightness of their straps, asking if they were comfortable and dealing, very briefly, with any special problems they might have was all that was necessary to reassure them. His psychologist-instructor had added drily that he would have over forty people to process pre-flight-wise and less than sixty minutes to do it in, so he simply had no time to undertake deep analysis.

Surprisingly the job did prove simple.

THE couches were laid out parallel and with the passengers' heads pointing in the same direction, so that they could all watch the large projection screen set on the underside of the deck above. The walking space between them was about six inches wide, except where the curvature of the inner hull allowed more. Mercer kneeled briefly beside each couch, reading the passengers' name tag as he checked their straps, saying the prescribed words and keeping an eye on the time by not looking at his watch, in the same way that he did not seem to be looking at the name tags stitched to their coveralls. He had to give the impression of being calm, unhurried and concerned with their individual welfare, the book said, and theoretically he could take all the time he needed to ensure his passengers' comfort before take-off. This was a passenger ship, after all, and a problem with one or more of the passengers was the only acceptable reason short of a serious malfunction for calling a Hold.

But Mercer would have to have a

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very strong reason for holding or the launch-control people would have caustic things to say, the captain would probably go critical and Prescott, who seemed to be a pretty poisonous character at the best of times, would certainly make his life miserable for the rest of the voyage.

"Are you comfortable, Mr. Saddler?" Mercer said pleasantly to the next in line, then stopped. This was one of the tough guys who had not taken his medication. Mercer stared at the man's face without really seeing it while his mind sought in vain for a pleasant and friendly way of telling him to take his anti-nausea pill and not be a fool. By the end of the allotted minute Mercer still did not have the answer and he saw that the passenger's face was becoming apprehensive and that he was refusing to meet Mercer's eyes. Suddenly he wriggled sideways in his straps so that he could reach his breast pocket.

"I'm sorry," he mumbled. "I nearly forgot to take my pill."

"It can happen," said Mercer pleasantly, "in the excitement."

The next two couches were occupied by the Mathewsons. Judging by the glazed look in Mrs. Mathewson's eyes one of the hostesses had seen fit to slip her a small caliber sleep bomb, which was already taking effect. Perhaps she had been frightened. Her son's eyes were enormous, but not with fear. Mercer found himself envying the hot, bright, uncomplicated excitement of the boy. With Mercer very little still happened for the first time. When it did happen for the first time—as it would in a very few minutes from now—the sensation would be diluted and deadened by the emotional impurities of fear and guilt and by his maturity and intelligence which would insist on computing his chances of meeting disaster during the period of maximum stress that was takeoff and by the other excitements of his short adult life, which had reduced his capacity to respond to this one. He wondered suddenly if the real reason for his being here was the fear that if he had stayed put he would have used up Earth and everything it had to offer and joined everyone else in the desperate search for small variations on old sensations.

Mercer smiled. Compared with the life most of his friends had led, his had been almost monastic. Below him Bobby Mathewson smiled back.

The next couch was empty for the very good reason that it was his own. Beyond it was the one belonging to Stone, the other

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passenger suspected of missing out on his pre-takeoff medication. Mercer tried the blank stare on him which had worked so well with Saddler, hoping that the man's guilty conscience would do the rest, but Stone simply stared back at him. Maybe his conscience was clear. Mercer had to be content with clearing his throat loudly and slipping a plastic bag between the other's chest straps where Stone could reach it quickly.

They would be different people in space, he thought as he gave a careful last look around, different but not necessarily better. The book had gone into great detail regarding the odd quirks and outright personality changes—occurring naturally, of course, and not induced by drugs—which some people developed during space voyage. It went into even greater detail about the deep-rooted psychological reasons for the phenomena. Mercer sighed, lay down on his couch and swallowed his own anti-nausea medication while he was strapping in.

On the screen above him the picture of *Eurydice* and the gantry was replaced by a view of the distant hills and landing lake as someone switched to the on-board TV camera.

He slipped on his headset and said, "Mercer. Passenger section ready."

Collingwood's voice sounded in his earpiece. "So I see. But are you quite sure that they are all settled and medicated? I realize that you are keen and are probably trying to impress me with your efficiency, but I shall not be impressed if a lot of passengers try to turn themselves inside out while we are dumping the boosters." The tone softened a little as he went on. "Missing the pip is an inconvenience these days instead of a disaster. Our launch window is as wide as we want it, so if anything that might require a Hold is worrying you—let's have it, Mercer."

While the captain had been talking Mercer had been thinking about Stone and wondering how he could explain his suspicions without sounding like a fussy old woman. He couldn't.

"No problems, sir."

"Good. We lift in four minutes."

Mercer spent the time checking that the vacuum cleaner under his couch was handy and worrying about the period of weightless maneuvering that would begin when they went into Earth orbit. Both the book and his instructor had painted awful pictures of weightless nausea running wild. It

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would become critical, they had said, a chain reaction that could spread even to those who had taken medication, and the job of clearing the air was difficult and distasteful. An incident like that was the one thing guaranteed to sour the whole voyage.

He was still worrying when the boosters ignited and acceleration piled invisible weights on his chest. The projection screen showed the launch complex and landing lake shrinking below them. More and more territory crawled in from the edges of the screen—the pale cross-hatching of a town, the gray smears of mountains flattened by the near vertical sunlight, tiny layers of shadow sandwiched between the ground and the clouds. He moved his head carefully so as to watch Stone.

Anyone with a TV in his/her living room had seen it all before.

III

"THIS is your captain, ladies and gentlemen. I hope you are comfortable and that you will have a pleasant trip. We shall make two complete orbits of Earth, during which a number of minor course corrections will be necessary for us to match orbits with Space-Station Three to dump our boosters. Please remain strapped in until these maneuvers are completed, which will be in a little under four hours when we reach the vicinity of the station.

"During the next fifteen minutes you will notice periodic fogging of the picture of Earth's face being projected on your screen," he went on quietly. "This is in all respects normal and is caused by the venting of surplus fuel from the boosters prior to their delivery at Three. Thank you."

"Roughly translated," Prescott's voice continued in Mercer's ear plug, "nothing out of the ordinary is happening except that we are slightly off course due to our having taken off exactly on time. Nobody bothers to do so these days and launch control doesn't have to be all that accurate, either. In the old days this sort of thing would have been very serious. But not with virtually unlimited reaction mass—"

"Careful, Bob," broke in the captain's voice, "or you'll be lecturing again."

"Nobody listens," said Prescott shortly and continued. "As a result we shall be using booster steering power at increasingly frequent intervals as we approach Three. During the final thirty minutes, Mercer, keep a sharp eye on your passengers."

"Will do," said Mercer. "In the

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meantime we will be weightless practically all of the time, as I understand it. Have I permission to rig the cabin dividers?"

"Yes," said Prescott.

Mercer lay unmoving for perhaps a minute, thinking about Prescott and the captain. The first officer, who was not a pleasant personality to begin with, was being actively unpleasant, probably to remind Mercer firmly and continuously that he was a space officer in name only. In complete contrast was the captain, who was patient and considerate and, as far as Mercer could see, pleasant to everyone, including Prescott. He wondered if the other crew members would emulate Prescott or the captain in their behavior toward their medical officer. He supposed that the answer would depend on how they had been raised to think of second-class citizens.

But suppose Prescott's feelings toward him were shared by the others—even by the captain—and the only difference was that the first officer's reactions were honest while those of the others were cloaked, for the moment, by surface kindliness and consideration.

Mercer shook his head angrily, trying to derail this highly uncomfortable train of thought. Surely he could take a little unpleasantness for the duration of the trip. Large numbers of people on Earth were made to feel inferior each and every day of their lives. But he still felt like giving Prescott an order simply to relieve his feelings—and suddenly there was something he could tell the first officer to do. He thumbed the transmit switch.

"Mercer. Our TV picture of the surface is corkscrewing as well as fogging. Too much of that might make our passengers feel uncomfortable. Can you—"

The screen went blank and Prescott said, "Right. Do you want to show a film instead?"

"I don't think so," Mercer replied. "Watching me trying to tie down the cabin dividers should be entertainment enough."

Before releasing his harness he waited to see if Prescott would have the last, unpleasant word, then decided that Collingwood had probably told the first officer to go easy on the new man.

The main supports for the cabins were two tough plastic rings just over half the interior diameter of the passenger module. With the four main support ropes and the inner spacer lines which kept the rings apart, the rings were clipped at intervals of a few feet to the underside of the deck above so as to keep the cordage from coming

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adrift during acceleration. Mercer pulled himself around the anchored rings, releasing the fastenings and tossing the main supporting ropes gently toward the deck below—all except the last one, the end of which he wrapped around his hand. Turning head down, he sighted himself at the rope's lashing point between two couches and, with all eyes upon him, kicked out hard.

In theory the mass and momentum of his body would draw out the double rings, whose inertia would slow him to a stop before he actually hit the deck. But Mercer, who had practiced this operation in a ground simulator with a system of weights duplicating the effect of weightlessness, had been sure that if he kicked too hard he would crack his skull on the deck or, if his aim were bad, bury it in someone's stomach. As a result he was a little too cautious—he did not succeed in pulling both rings far enough from their housing. Instead of reaching the deck his misjudged dive stopped a few feet above the acceleration couches and he began to swing toward the middle of the compartment.

Ignoring the grins as well as the eyes watching him, he cleared his throat and said, "Would one of you mind grabbing my feet?"

Immediately the deck sprouted a forest of clutching hands, which eventually succeeded in checking his swing. But the rings had begun to swing as well, giving him a lot more slack on the support rope he was holding so that he toppled slowly and gently across two doubly-upholstered couches, the upper layers being female.

The layer called Miss MacRoberts giggled and the other, whose name he could not read because of the topological features distorting her identity patch, said, "Pleased to meet you."

Mercer apologized gravely and began moving back to the lashing point by gripping the edges of intervening couches with his free hand and pulling himself along. Within a few minutes he had the support rope in position and pulled taut.

Above him the two rings swung and vibrated slowly, shaking their attached cordage into the beginnings of a weightless tangle. Mercer dived carefully across the deck, snatched the second support rope out of the air as he passed it and checked himself with his free hand against the couch beside its lashing point. He was beginning to get the hang of his task.

BY THE time the first surge of steering thrust came he had the

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supporting lines in position and was beginning to weave a double web of cabin dividers between the now rigid rings and the inner skin of the hull. His earpiece had bleeped a five-second acceleration warning, so he had plenty of time to wedge himself between two couches and hold on. But when it came the surge was so gentle and his grip on the couch edges so tight that he felt ridiculous. When a double bleep signaled the cessation of thrust he nodded silently to the passengers on each side of him and returned to work.

During the next three hours the surges came with increasing frequency, but he was usually close enough to a bulkhead or one of the rings to hold on until they had passed—although on one occasion he misjudged. He ended the weightless tumble that followed by doing an awkward handstand on the edge of someone's couch.

It was not easy to maintain a pleasantly grave expression or to pretend that this sort of activity was in all respects normal as he murmured, "Sorry, ma'am," and returned, like an industrious—if ungainly—spider to weave his web.

Looking incredibly fragile and completely purposeless his double web neared completion despite these interruptions. In the suborbital configuration and during the initial powered stage of their trip the thing was simply a highly porous obstruction to anyone wanting to watch the screen. But when the reactor that would give them a half-G of thrust for the first two days of the flight closed down, artificial gravity would be supplied by spinning the passenger section about the longitudinal axis of the ship. The walls of the inner hull would then become the floor and the double web would support clip-on plastic sheets and the passengers would have cabins and privacy of a sort.

The cabins would even be roofed over so that crew members moving along the weightless axis between control and the power module aft would not be able to see the sort of things reputed to go on in passenger-carrying spaceships.

People tended to forget the rules when they were far from home, his instructor had warned him, and the degree of forgetfulness was in proportion to the distance.

His mind was not entirely on his job, he realized suddenly, or he would not have missed hearing the thrust warning. As it was, he found the section of support ring he was working on moving away from him and instinctively tightened his grip on the attached

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line he was holding.

Just as the line was drawing taut against its ring, thrust was applied at right angles to the previous surge and he began a slow swing around the support ring, a swing that would ultimately wrap his line tightly around the ring. For a few seconds this did not worry him, but then he realized that as the line wound itself tight it would shorten and his speed of rotation would increase—it was already speeding up, in fact. With his free hand he reached for one of the divider ropes as it whirled past, but could only touch it. All he succeeded in doing was to start himself spinning on the end of his rope as well as describing diminishing circles around the ring.

Dizzy and confused, Mercer tried to work out how fast he would be traveling by the time his line was completely wound around the ring. Almost certainly it would be too fast for him to transfer his grip from the rope to the ring—and if he let go at that speed he would go bulleting into the deck, bulkheads or passengers like a stone from a slingshot. The time to let go was now, while he was still moving relatively slowly. But his hand seemed to have a mind of its own—the more he thought of letting go the stronger became its grip on the rope.

Mercer closed his eyes and tried to think. He had more than two feet of slack wrapped around his hand. If he released that the radius of his swing would be increased and his rotation slowed. He would do just that and hold on to the last few inches of rope until he was swinging toward the inner hull wall, then bend his knees to absorb the shock of landing and let go.

But the end of the rope slipped from his hand before he was ready and he went tumbling slowly toward the middle of the deck. For a moment he thought that he would be fantastically lucky and land on his own couch, but instead he landed sprawling on the one beside it.

The passengers began to applaud and Mrs. Mathewson said crossly, "Do you always try to land on defenseless women?"

"Only the pretty ones, ma'am," Mercer said, before he realized that his great relief at not breaking his neck was possibly not shared by the passenger he had landed on. But before he could apologize properly his earpiece bleeped a thrust warning and he squirmed into his own couch.

HE HAD the webbing around his ankles when thrust tilted him gently to one side, then the other, then tried to lift him out of the

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couch and twist him at the same time. Someone grunted and gave an odd-sounding cough. Mercer swung around to see the passenger called Stone rapidly filling his plastic bag.

Stone had been a little late in getting the bag to his mouth and some of the material was drifting above his couch where the next surge of acceleration would send it flying all over the place. With his feet still held by the webbing Mercer unclipped the sucker from the underside of his couch and went after the stuff, pulling it into the small but powerful vacuum cleaner and leaving in its place a fresh smell of pine trees and heather. Then he helped Stone until the latter had quite finished, sponged Stone's face and produced a water tube and an antinausea pill.

"Sorry about that, Mr. Stone," he said. "But there are some people who seem to need double the usual medication."

Stone had the grace to blush.

"Mr. Mercer," said Prescott in the earpiece. "Attitude maneuvers are completed. Will you come to control as soon as convenient." His tone was almost polite and made Mercer feel uneasy.

His first impulse was to rush to control right away and take what was coming to him for his recent stupid and dangerous display of weightless acrobatics. But ten more minutes' work would complete the rigging of the cabin dividers and he might just as well go up there with one job done properly, even if he had nearly killed himself doing it. While he was tightening the last rope the screen above him lit up with a clear, sharp and steady picture of space station Three.

A few seconds later he made a slow, careful dive toward the well connecting the passenger compartment with control and rose past the level of the officers' cabin and the enclosed ladder used when the ship was under power or on the ground. He did not bump against anything on the way up, so apparently his weightless movements were becoming more accurate. Even so, he was feeling far from confident as he checked his dive at the entry to control, made sure that his zips were properly fastened and that his cap was still on straight, and entered.

Prescott pointed at the empty couch and said angrily, "Lie there, Mercer. Watch the screens or look out through the window. Don't touch anything."

Communications Officer MacArdle and the engineer, Neilson, looked angry as well. So did the captain. But Collingwood

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tried to smile as he said, "You did very well, Mercer. But as an entertainer you should avoid overexposure and you were in danger of—"

"Fracturing your skull," snapped Prescott.

"I'm sorry about that," said Mercer. "I missed hearing the thrust warning and got caught—"

"You missed hearing it," said Prescott furiously, "because MacArdle was so interested in your performance that he forgot to send it. But even a medical officer with a fractured skull would probably not be enough to put a Hold on this trip. I have never in my life seen a lousier, more slapdash launch—"

"Leave it, Bob," said the captain tiredly. To Mercer he added: "Mr. Prescott, you may already have noticed, is an astronaut of the old school. His experience goes back to the time before space travel was officially declared safe. He is inclined sometimes to fuss."

"At least let Neilson and me eyeball the drive grids as we're dumping the boosters—" began Prescott.

Collingwood's hand twitched as if he had been about to point at the displays around them, and he said, "Bob, there's no need." He paused, looked at Neilson for a moment, added: "But to keep you happy we'll have the station send up closeups of the withdrawal sequence."

"The definition," said Prescott, "will be too poor to resolve the fine details or show—oh, forget it." He stared angrily at, or maybe through, Mercer who tried to pretend he was elsewhere.

As he looked at his twin displays—one showing his charges in the passenger module and the other the same picture they were seeing on their screen—he wondered why Prescott had sent for him if not to give him a ticking off. Mercer's instructor had told him that some medics were not allowed into the control room until several weeks of a voyage had elapsed. His presence here could have been a compliment, a pat on the back for being a good, hard-working boy—except for the fact that Prescott so obviously did not like him.

Maybe that was why he was here. Prescott did not like anybody it seemed—and this could have been his way of showing it. He had told off MacArdle in such a way that the communications officer would be just as angry with Mercer as he was with Prescott. Everybody, even the cool and normally easy-going captain, was angry with Prescott and they were only four hours out.

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Mercer was beginning to wonder if he should have stayed at home.

But then his eyes went to the direct vision port and his doubts faded. The television pictures of this had only been a shadow of the reality and, one way or another, a man could pay an awful lot to see scenery like this.

IV

STATION THREE had begun to kill its rotational velocity long before *Eurydice* had been launched. Now it hung motionless like a gigantic, uncompleted wheel comprising six tubular spokes arranged in two diametrically opposed groups of three and two short tubular sections of rim, which linked each group of spokes at the periphery. Unlike its smaller predecessors, One and Two, which were structurally complete and no longer capable of further growth, Three was still only a pup.

It would take many years of time and effort—and *Eurydice* and her sister ships would have to pay it a large number of passing visits to donate their boosters—before its thirty spokes and far-flung rim would be completed. The boosters wrapped around the ships' stern and waist sections and emptied of their fuel, formed the building blocks of the vast wheel. Upward of four thousand people would inhabit the station finally—to conduct the more exotic types of research that would ultimately put space, time and gravity to effective use and make slow-burners like *Eurydice* as obsolete as dugout canoes. One of its first—and perhaps easiest—jobs would be to impose a strict control on Earth's weather.

Later it might give men the stars, via either faster-than-light drive or the longevity to reach them. It would support and extend the work already being done on the bases of the Jovian moons.

The work was the kind Mercer wanted to do among people who freely admitted to being insane for living how and where they did and who tried to put at least as much into their highly technical culture as they got out of it—a culture that was neither as permissive as Earth's of the past decades nor as viciously forbidding as the neo-puritan one that was beginning to replace it.

Mercer was too cynical to believe that the people of the Jovian colonies had built a utopia for themselves—they simply had been very thoroughly screened. There was no mesh in the screen, of course, but it was up to six hundred million miles thick and any-

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one who made it through even once had to be someone quite special one way or another—of that Mercer had been very sure until the crew of *Eurydice* had started leaving clay footprints all over his nice, bright illusions.

"Withdrawal sequence starting—now," said the captain, arousing Mercer from his daydream, "Neilson, stand by. MacArdle, ask Three for a long lingering closeup of our tail and be careful how you phrase it." He smiled, looked at Prescott and stopped smiling as he added: "As soon as we clear the boosters we will roll the ship. All of you take a long, hard look."

Prescott made no comment. He was staring at Neilson who did not look at all happy.

Mercer divided his attention between the port and his screens while the men began playing an esoteric game involving the calling out of numbers and groups of initial letters while their fingers tapped illuminated buttons, their quiet voices and easy manner not quite concealing their deep concentration on what they were doing. The station TV showed *Eurydice* begin its inching withdrawal from the boosters. As the ship withdrew it began slowly to rotate.

On the passengers' screen the station was already slipping off the edge so that they would have nothing to look at until it came on-screen an unguessable number of minutes later. He had no idea of how long the visual inspection would take and the crew was too busy for him to ask, so he switched the passenger screen to the station signal so that his charges would have something interesting to look at. Then he froze, looking guiltily at Prescott as he wondered whether he was supposed to do things like that without first asking permission.

But Prescott merely nodded and continued with what he had been doing and saying.

Almost imperceptibly *Eurydice* withdrew from her boosters, like a bolt being slowly unscrewed from an enormous truncated nut. First the bulge of the passenger section twisted out, then the long cylinder directly behind it, which housed the free-fall lounge and the water tank containing the reaction mass for the nuclear engine, and finally the long, tapering cowling of the reactor itself. As it drew clear, panels opened and retractable sensors and focusing coils unfolded themselves, breaking up the clean outline.

The wall speaker cleared its throat and a voice from Three said,

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"I've got a telescope on you—it gives much better definition than the TV camera. But what exactly am I looking for, fellows?"

The captain glanced at the first officer without making any attempt to reply.

"Prescott. Nothing in particular, friend. It's just that I'm the worrying type."

Mercer expected a sarcastic retort, but instead a long silence ensued, broken when the voice said, "You look good from here, Bob. I'll slip a filter onto this thing and watch while you light your torch. But if you're going to do something melodramatic with your reactor, don't do it too close to the station, huh?"

"Wouldn't dream of it," said Prescott.

On the station picture *Eurydice* drifted away from the boosters, spurting bright balloons of fog as she lined up for the Jovian orbit insertion. The crew was completing the attitude checks and the captain was telling the passengers to expect thrust in ten minutes. Mercer concentrated on his own small, overly simple control panel, angling the remote-controlled TV camera on the outer hull to give what he hoped would be a picture of the space station falling away when they began their burn. The closeup of the tail being transmitted by Three at that time might be a little disconcerting to the uninitiated.

Such as myself, Mercer thought.

A FEW seconds before Neilson pulled out his dampers Mercer switched pictures. Then the couch was pushing him gently in the back and Three began to shrink away from the edges of the screen. The enormous structure diminished steadily until it became a tiny, dazzlingly white insect enclosed by the sunset terminator.

"Very artistic," said Prescott. "You'll spoil them if you aren't careful, Mercer."

"A large part of my job," said Mercer stiffly, "is keeping the passengers happy. I was told that—"

"And a small part of my job," Prescott broke in, "is seeing that you do yours correctly. Now, what will be the next item offered for their delight? More acrobatics?"

Mercer shook his head. "Rigging the cabin walls at this stage would interfere with passenger visibility during the survival film. And that should wait until after they have eaten and they begin to realize that they are really in space. So first I introduce them to weightless eating and see that

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they don't make too big a mess doing it."

"No," said Prescott sharply. "First you switch off the hull TV camera. Station Three will shortly be out of sight and a continuous picture of a receding Earth might make someone homesick. Then you will announce lunch and then let them get on with it. Ship's officers are supposed to remain aloof from the passengers, Mercer, and running after them too much gives the impression that you are little more than a steward. You are, but they must not be allowed to know that. When we cut thrust in two hours from now—for a few minutes only to test the damper controls—the mess they will have made will be so obvious that with luck they will feel too ashamed of themselves to risk the same kind of mess again. Only then will you go down there—for the first and only time—and clean up. But it would be much better for your image if you chivied one or more passengers into doing it."

"That was how the last medic got himself fixed for the rest of the trip," said MacArdle, laughing. "But one housemaid wasn't enough for him and he began—"

"Mercer," said Prescott, "what are you waiting for?"

Seething behind what he hoped was a poker face, Mercer killed the picture of the beautiful crescent Earth and spoke to the passengers as he had been directed. He had known people like Prescott most of his life—teachers and professors and surgeons who had stomach ulcers or bad domestic trouble or who had simply inherited a nasty disposition. There were only two ways to react to them—either ignore them and their continual jabbing until they themselves got tired of doing it or display a controlled reaction designed to show them that they were not dealing with a sponge that soaked up everything without protest.

"Four hours should be enough to let them eat and get to know each other," Prescott continued, "and not enough to allow arguments to start. You will spend those four hours in your cabin, resting, after which you will see to the tidying up and contrive to introduce the subject of safety and survival in space. You will try to do so without scaring half the passengers to death."

"Just because I've spent most of my life studying for examinations," said Mercer quietly, "doesn't mean I'm stupid."

"There is a difference," said Prescott just as quietly, "between education and intelligence."

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"But I'm not tired," said Mercer, knowing that he was losing on this exchange but not wanting to admit it.

Prescott sighed. "If you don't go to your cabin," he said, "we won't be able to talk about you behind your back."

As he climbed down to his cabin, very carefully despite the half-G thrust, Mercer was not really surprised to hear Prescott talking to Neilson with occasional interjections from the captain, or that the subject of the conversation was far removed from the ship's medical officer. He opened and closed the seals into his cabin, cutting off the sound of voices and feeling like a child dismissed from a room where the conversation was too adult.

UNLIKE the other officers' cabins, which were fitted with more sophisticated equipment, occupying much less space, Mercer's did not give much room for him to move. From the entry lock the floor grill stretched ten feet to the curved plastic canopy that ran from below his feet to what was nominally the ceiling and gave, in the ship's present mode, a hundred-and-eighty-degree view of the inside of the outer hull, complete with structural members and brightly colored cable runs. The floor grill, which was just under three feet wide, separated two vertical tiers of bunks, eight on one side and five on the other. This was because the lowest one of the five was Mercer's and he, being the doctor, needed much more than the twelve inches that divided the patients' bunks.

A passenger unfortunate enough to come down with an infectious disease could be isolated from the living quarters and other patients. The bunks were fitted with their individual air supply and a hinged flap that sealed in the patient. Mercer did not suffer from claustrophobia, but he thought that any patient needing to spend more than a few days in one of those bunks would have to be kept under heavy sedation or he would blow his organic computer.

His own bunk did not have all that much elbow room, of course, surrounded and overhung as it was by communication and control panels and cupboards containing medication. There was much more than he could ever expect to use, even if a dozen epidemics swept the ship. Nevertheless, Prescott did a quick check of the medical supplies, then strapped himself into his couch.

But not, he was sure, to sleep.

The buzzer had a low, insistent note that gradually increased in

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pitch until he signaled that he was fully awake by switching it off. It was replaced by the sound of the captain's voice, which could not be switched off, ever.

"Mercer, you have been sleeping peacefully, if rather noisily, for the past five and a half hours. During that time your passengers had their first meal and did quite a lot of socializing, so there was no need to wake you. But now the natives are growing restive. As soon as you've eaten go back and see that the place is tidy, then set up for the survival lecture and film. We shall go into cruising mode in just under four hours, so you have plenty of time."

"Yes, sir," said Mercer.

"We are required by law," the captain went on, "to conduct three survival drills as soon as possible after takeoff, even though nothing has ever gone wrong or, considering the current fail-safe structural philosophies and the multiplicity of backup systems, is ever likely to. But you know all this. You also know that, to keep the passengers from feeling nervous, the first drill is treated as something of a joke—an amusing film followed by a light-hearted question-and-answer session. Don't frighten them, Mercer. But don't be too much of a comedian either."

For a few seconds the captain had sounded exactly like Prescott, Mercer thought. He was beginning to understand why the medic before him had tried to make so many friends among the passengers. Or was it his predecessor's behavior with the passengers that was the reason for Prescott's and the others' treating him as they were doing? It was very hard to know which end of the stick was being used to beat him.

He was still pondering the question when he returned to the passenger module. The deck was not nearly as untidy as he had expected, nor had the litter been widely scattered by the brief cessation of thrust. Mercer nodded politely to anyone who waved, smiled or otherwise noticed him as he headed for his couch. He had already decided on the people who would volunteer for the cleanup squad.

"Your attention, ladies and gentlemen," he said, using the module's PA. "By now you should have finished your first meal in space—no doubt with a few accidental spillages here and there—and begun getting to know each other. You will have plenty of time—four months, in fact—to finish getting to know each other, but cleaning up the litter is much more urgent. That is why I would

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like three of you to help me by—"

They were suddenly like a classroom full of eager pupils with the answer to teacher's question.

Mercer shook his head. "I knew you would all like to help, but to avoid offending anyone I shall pick the three people closest to me, if they have no objections."

They hadn't. Mrs. Mathewson smiled and nodded. Stone nodded without smiling and Bobby Mathewson was trying desperately to salute with his arm tangled in webbing, his eyes almost as wide open as his mouth with excitement. Mercer concentrated on the boy.

"We do not salute on this ship," he said gravely, "nor do you call anyone 'sir' except the captain. Saluting spacemen happens only on television—so you are Mathewson and I am Mercer."

Treat a boy like a young man, his instructor had told him, *and you won't go far wrong . . .*

Explaining the operation of the cleaners over and over again until he understood it completely was something he could do to the boy but not to the two adults. Repeating instructions to them might make them think that he considered them stupid. But this way they would all be sure to get it right without his running the risk of their taking offence. Finally he turned the three of them loose, watched them at work for a few minutes, then returned to his couch to call MacArdle to have the survival film ready to run.

Prescott and Neilson climbed into sight a few minutes later and stood looking around the passenger deck. Mercer went across to them in case they had instructions.

Prescott stared at him without speaking. Neilson did not look at him, but said, "I don't understand you. Look at that blonde on couch eighteen and the Asian on twenty-three and you gave away the job to a man, a widow and—and her ten-year-old boy. You're missing chances, Mercer."

He spoke softly so as not to be overheard by nearby passengers and without moving his lips, just like a convict in an old-time prison film. Mercer tried to copy the expression and intonation as he replied, "Maybe I prefer ten-year-old boys."

Prescott laughed. It was a harsh, unrelaxed sound, probably because it was produced by a mechanism stiff from disuse. The two men left Mercer and continued their climb toward control.

V

THE film was beautifully made, technically excellent and with a

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nice balance of animation and real footage—but it lacked accuracy. Not that it made any deliberate misstatements, it was just that watching the antics of a cartoon character did not give a true picture of a real person's physical and mental capabilities.

A smiling young pseudo-spaceman who had cut his gleaming teeth on a great many TV commercials began by introducing everyone to the ship, talking brightly over performance and payload charts, design philosophy and an animated staging sequence. Then he began taking the ship apart, literally, into neat, color-coded sections, magnifying each section and detailing its function—control, officers' quarters, passenger lounge and cabins, weightless lounge, reaction mass tank and the eye-twisting detail of the reactor itself. Mercer's sick bay/cabin looked ridiculously large for one man and thirteen patients while the quarters of the passengers were unbelievably spacious.

Mercer did not believe and neither, after a few days, would the passengers.

"... and now," continued the smiling spaceman, hesitating as if to apologize for wasting the audience's time on nonessentials,"we come to the subject of survival should an emergency arise. No such emergency has arisen in the past nor, considering the rigorous checks and inspections carried out before every flight, is one ever likely to occur in the future. But we are obliged by the regulations to explain our survival equipment and to give you the chance to practice with it—"

Mercer had already seen the film many times and had listened to much more detailed lectures on the subject. His train of thought branched off onto a different but nearly parallel track.

In his line of work human life had always been considered of paramount importance—in theory at least, a life was valued beyond price. But the cost of protecting the lives of officers and passengers in a spaceship, where every kilo hauled out of Earth's gravity represented enough coin of the realm —anybody's realm—to make every person on the ship comfortably rich from the cradle to the urn, was astronomical. Naturally the price of the passengers' tickets did not defray even a small fraction of the transport bill, much less the extra-weight penalties represented by backup systems and survival equipment. Those items were conveniently lost in the even more complex systems of government

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bookkeeping under headings like national prestige, technological spin-off and assisting the maximum utilization of technically trained manpower.

Human life seemed to grow more and more valuable the farther it was removed from Earth. In space its value was incalculable; in the five-hundred- and thousand-seat transports flying between five and ten miles above the surface it was merely high and on surface transport systems the powers that were did not seem to worry too much about lives. But no fare-paying passenger had ever been lost in space, while a few hundred a year on average were cremated in metal birds which prematurely stopped flying and on the surface people mowed each other down with cars in thousands daily.

Mercer had spent two years with an organization that "processed" road accidents. That was how it referred to its function—too few of the victims survived for it to call itself a hospital that cured people. He had grown up in—and was now, he realized, trying to flee—a technologically advanced, ultra-fast and strangely bored society whose casualties had had the depersonalized, sexless sameness of so many mashed flies. The drunken or drug-ridden or simply bored drivers and the careless or absent-minded or innocent bystanders victimized, when they were separated from the machinery or the machinery was removed from them, could rarely be made presentable by even the most conscientious of morticians.

Mercer's thoughts were taking a morbid turn. He had long ago discovered that no simple answers existed to complex problems. The best thing he could do right now was to give all his attention to the survival film, while trying not to look openly scornful of the simple answers it was giving to what would be, if it ever occurred, an extremely complex and lethal problem.

The spaceman with the teeth, the cap worn on the back of his head and practically all of his uniform zips undone was saying "... in the unlikely event of such an emergency the passengers and crew will probably have several hours or even days to abandon ship—a process which can, if necessary, be carried out safely and without undue fuss in a few minutes. The next stage deals with the mechanics of the abandon-ship sequence, showing the basic actions first and then repeating them with certain variations—"

ON THE screen the distressed ship developed a faint red halo

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around its reactor. The halo began to brighten and pulsate, but not quickly enough really to frighten anyone. Farther forward the passenger section continued to spin slowly as it furnished artificial gravity, while the rest of the ship held steady. Gradually it slowed as braking devices went into operation, making the ship a rigid unit again in the pre-cruising mode. The spinning passenger section had imparted its rotational inertia to the ship as a whole, causing it to spin at half its original speed.

Suddenly the ship emitted long white cylinders that flung themselves away from the spinning vessel and expanded into large globes as they went. Shortly afterward four larger, wedge-shaped sections of the forward structure—the modules containing each officer's cabin—broke away and followed the expanding circle of passenger globes. The remains of the ship—looking warped and lifeless, although not frighteningly so—shrank as the wedges and globes radiated from the wreck and the screen took in a steadily expanding area of space. Finally the ship disappeared and the survival pods applied thrust for a few seconds and began their slow return to the recovery area until they were grouped like spherical sheep around the officers' segments, which had also returned and were waiting for them.

On the second time around the sequence went into greater detail regarding the method of entry into the survival pod, its airlock, radio, two-shot thrust motor and other rather sparse appointments. The final treatment of the sequence, which was too delightfully droll to cause anxiety to anyone, dealt with methods of attitude control in a vehicle fitted with only one short-duration and fixed-direction thruster.

". . . Most of you are probably thinking by now that our survivors are being given an awful lot to do," said the space officer star as his face replaced the image of the survival pods, "or that the globes should contain more sophisticated equipment, such as proper attitude control, navigation computers and the like. But you must remember that your survival globe is little more than a lifebelt and that a lifebelt cannot be overloaded or it will sink. Believe me, the equipment is adequate.

"It is adequate," he continued in a proud, solemn voice while he tapped his temple very slowly with his right index finger, "because each will be carrying at least one organic computer of a type that

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has been tried and perfected over a million years."

In control MacArdle brought up the lights and expertly faded out the background music. Mercer stood up, swaying slightly in the low gravity, and looked over his charges.

Before he could speak the passenger called Stone tapped the side of his head and said solemnly, "He makes me feel proud—and kinda sick."

Me, too, thought Mercer.

Aloud he asked, "Any questions?"

"What I would like to know," said a passenger with Miss Moore stamped on her identity patch, "is why we don't have officers like that on this ship? Why don't you relax a little, sir? Can't you smile the way he did?"

"He probably can't" said Mrs. Mathewson, laughing, "because his teeth are real and a bit uneven."

"His eyes look a bit uneven, too," Miss Moore said, "but they are a nice shade of—"

"An optical illusion, ma'am," said Mercer hastily, "caused by one slightly thicker eyebrow. But I was inviting questions on survival in space."

"And I was asking one," she replied, looking him straight in the eye. "I was wondering if you had any suggestions on how I can survive the boredom of living for four months in a hermetically sealed can of space-going sardines. Perhaps some of the sardines will cooperate in relieving the boredom?"

Mercer nodded and said seriously, "Provision has been made for various forms of individual and group competitions and entertainment. Nothing too strenuous, of course, although it is advisable to take a certain amount of exercise every day to avoid balance and blood pressure problems after we land. We have music tapes and films, most of which are fairly recent—by that I mean that they have not yet been released for television. There will also be instruction in weightless swimming and ballet, which brings me back to the survival drills. Even though their usefulness is arguable, the three sessions we are obliged by regulations to stage can be very interesting and often amusing."

The silence began to drag until Stone said, "What we really want to know is what our beautifully designed individual flight plans say between the lines. There isn't much space between the lines, of course, but if all the rumors we've heard are true it is very well filled. How about filling in a few of them for us?"

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PRACTICALLY all the passengers were watching Mercer and listening—or not watching him and listening even harder. He nodded gravely and said, "There is very little to add. The rules are few and not at all strict, so that you should be bound only by the dictates of common sense and consideration for each other. You will be living in a restricted space, sharing toilet and amusement facilities and using cabins providing visual privacy only. It is a good idea to put a little effort into liking instead of disliking the people around you."

"Love your neighbor?" asked someone.

"Apart from this largely self-imposed discipline," Mercer went on, "there are no rules as far as the passengers are concerned and you will be left pretty much to your own devices. But if some form of individual or group activity proves harmful to the ship or other passengers the person responsible will be warned and if necessary restrained in sick bay—"

"A fate worse than death, I hope," said Miss Moore.

Mercer nodded. "If you call spending four months in a bunk the size and shape of a coffin under partial sedation a fate worse than death I'm inclined to agree with you," he said, allowing his irritation with Miss Moore to show for a moment. Mercer knew that he was not supposed to talk as bluntly as this to passengers on the first day out and Prescott would probably skin him alive for it. He forced himself to relax and continued, "But that kind of trouble is unlikely to arise in a healthy, civilized group of people like yourselves. This isn't flattery. You all know how thorough were the medical and psych checks you had to take before being allowed to book passage."

The trouble was, Mercer thought, that in this degenerate age the mental norms had been stretched to fit some strange psych profiles. About all he really could be sure of was that none of the passengers were or had recently been on hard drugs.

He continued, "With the exception of myself, the ship's officers have their own specialist duties to perform and will intervene only if somebody starts a riot or tries to kick a hole in the hull. A part of my job is to see that you all adapt to shipboard life as quickly and easily as possible, to keep a check on your health and to instruct you in the use of such items as the swimming facilities and, of course, the survival equipment. I shall not intrude on your social activities even if invited to do so

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and you are all free to do pretty much as you please. Have you any questions?"

Inevitably the Moore woman had a question, the same question with a slightly different slant.

"How will the officers be able to survive the trip," she said, "with nothing to amuse them but computers and textbooks? I realize that you are all highly trained and disciplined supermen—but four months of self-imposed celibacy in a space-going monastery cell? I mean, is it necessary?"

Mercer was silent, thinking that the simple answer was that it was not necessary and that his predecessor's behavior was becoming much more understandable to him. In *Eurydice* temptation was anything but subtle if this was the kind of question that could come up during the first day's flight. He wondered what Miss Moore did in real life and he was still wondering and trying to think of a diplomatic reply when Mrs. Mathewson rescued him.

"Maybe our supermen are interested only in superwomen," she said.

VI

THE transition from powered to free flight occurred half an hour later. The anti-nausea medication he had administered just before takeoff was still doing its job so that the upsets were psychological and intra-personal rather than digestive. They came about as a direct result of the transfer of passenger couches from the deck to what had been the walls of the compartment.

Mercer had demonstrated the safe, easy way of performing the operations—by lying face down, held in position by the waist straps only and allowing the arms and legs to project over the edges of the couch to propel it along, check its progress or fend off other couch riders on collision courses. But in the weightless condition the couches were too easy to move and, although they did not weigh anything, their inertia was considerable. Set moving in the wrong direction or pushed too hard they could give a nearby passenger a very painful nudge.

While they were being moved into their new position Mercer also had to exercise a great deal of discretion regarding who would be occupying adjoining cabins—especially when four or five passengers insisted on adjoining a sixth, who did not wish to adjoin with them. Finally he had to check that the passengers had not positioned their couches across the line of a dividing wall, or over a light

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fixture or on top of a life-pod escape hatch.

At that stage he signaled control to begin spinning the passenger compartment and gradually the occupants began to stick with increasing firmness to their new floors. The spin increased until centrifugal force pressed them against the interior of the hull with an apparent gravity one half that of Earth normal. Forward and aft of the passenger sections the compartments which were supposed to remain weightless had begun to rotate in the opposite direction and Mercer could hear the regular thump of tangential thrusters checking the precession. But none of the passengers seemed worried by the noise—they were too busy laughing and waving at fellow passengers who were apparently standing on the ceiling, waving back at them.

Mercer waited for a few minutes to allow them to get used to the sensation. Finally he made his way to the section of plating occupied by the Mathewsons and asked if he could borrow Bobby. With the boy's help he began distributing the plastic cabin dividers, demonstrating the method of attaching them to the supporting lines so that they formed four taut, plastic walls and a pull-across door sheet that could be sealed from the inside. By the time he had finished explaining how it was done to the last passenger the first cabins were complete and he was able to return Bobby to his mother.

"He's been a big help, m'am," he told Mrs. Mathewson and he was not merely being polite, "but the work has overexcited him a little, I'm afraid. I suggest you give him the adult dose of sedative."

He kneeled briefly beside her couch, pressed the release stud on a plate set flush with the floor. He flipped it back, explaining that the cover was simply for protection during the couch-moving operation and that the recess contained a call button, microphone and speaker to enable her to contact him in control or the sick bay if the need should arise.

"But right now I suggest that you take a half-hour getting used to the place and preparing to turn in," he said. "The cabin walls are opaque but translucent and we shall be switching off the main lighting in an hour. If you want to read the directional light on your couch will not inconvenience anyone who may be trying to sleep."

"As for you," he said to the boy, "you can stand down. Don't forget to take your medication. I shall probably need you again tomor-

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row and I don't want you half asleep on your feet. Good night, Mathewson."

"Good night, Mercer," said the boy. His mother smiled and nodded.

In the next cabin he went through the same drill and in the next. Some of the faces registered on him, but others did not because he kept thinking about Mrs. Mathewson and the difference a half-G had made to her face, easing the tension lines and rounding out her features and figure. She had last looked incredibly young to have a son of ten years. He wondered suddenly if she had escaped from more than just the gravity of Earth.

His final job before leaving for control was to stick name and number patches to the cabin door sheets and draw up a list of who was where.

THE control room was quiet and the expressions on the faces of its occupants made it plain that they wanted it to stay that way. Mercer nodded to Neilson and the captain—the only two who bothered to look at him—and floated into his couch. He clipped his list to the back of his left forearm and began printing the passengers' names on self-adhesive cards that he placed beside the numbered lights on his call board. By the time he had finished, the vision pickup showed the passenger compartment in darkness and his fellow officers were showing signs of breaking their vows of silence.

Beside each numbered call light was a switch that energized the cabin microphones without, of course, acquainting the occupant's with the fact. He brought in the Mathewson cabin first, listened briefly to heavy, adult breathing too irregular for its owner to be asleep and a childish whisper saying ". . . and God bless Mum and Dad and make him the same every day . . ."

Quickly he flipped off the switch, realizing that Bobby had revealed a great deal about the Mathewsons in a very few seconds. At least on the ship they would not be troubled by a man who was a different person practically every day of the week.

The other switches brought in the sound of peaceful breathing and one the silence of an empty cabin. He checked the pickups in the heads, which were also empty and, with visions of a passenger lost in the dark and blundering through fragile cabin walls and wakening everyone, he began thumbing the switches systematically, searching for an incipient disturbance.

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He did not find it. Instead he brought in a whispered conversation from a supposedly single cabin, which he switched off hurriedly as it was reaching an interesting stage.

"Spoilsport," said MacArdle.

"Sorry," said Mercer. He laughed, ridiculously pleased that someone had at last decided to speak to him.

"There is no necessity for you to remain on duty, Mercer," said the captain. "Your handling of the passengers has been very good and your own behaviour excellent, so far. Why don't you get some extra sleep in your cabin while you have the chance—you have a dupicate board there and the call buzzer is loud enough to wake you should a passenger need attention."

They don't want me around, thought Mercer angrily. Unlike Prescott, the captain was being polite—even complimentary—in his dismissal, but it was plain that Mercer was not one of the team and that they did not want him hanging around. But all at once Mercer did not want to be sent to bed like a small boy. He was going to be hanging around for the next four months at least and the sooner they got used to the idea the better. Besides, the captain had not actually ordered him below.

He smiled and said, "Thank you, sir. It has been rather hectic down there, but there are times when I find my own company a strain as well. So if you don't mind, sir, I would like to stay for a while and enjoy the atmosphere of sanity and peace."

They did not even look at him and the silence lengthened until finally Neilson said drily, "It isn't peace, Mercer—it's more like a temporary cease-fire."

Prescott stirred on his couch, but it was the captain who spoke. He sounded polite and friendly and a little absentminded, as if an argumentative medic were only one of his problems.

"It is possible that you will grow exceedingly tired of the control room and the people who inhabit it in the months to come, Mercer," he said. "But you are welcome to stay here, of course, even if there is nothing for you to do. Unless you would like to spend some of the time telling me what you have planned for tomorrow? At one stage, after the cabin construction period, you were apparently organizing card games. Why?"

"Yes, sir," said Mercer. "Two of the passengers seemed to be worried by the survival film and I changed the subject by telling them that weightless swimming was available to everyone once

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the ship was in cruising mode. I mentioned cards as being a fair way of deciding who would be the first two people into the pool with me. I'm afraid two at a time is as many as I can handle until I've had a little more experience myself."

"And the survival drills?"

"In the circumstances I thought of delaying them for a few days," said Mercer. "Passenger nervousness can be catching and my instructor told me that quite a lot of latitude is allowed in the timing of these drills. Also that the partial dismantling of cabin walls can be irksome if the passengers are not already a little bored and willing to play a new, if somewhat inconvenient, game. Of course, I could take small groups of less nervous passengers and give them survival instruction until most of them were proficient. That way the first full-scale drill would not be the shambles that the book says it usually is."

He stopped because the captain was shaking his head.

"I'm sorry, Mercer," he said firmly, "but I don't agree with that part of the book. I think that I can trust you to carry out the exercise without creating too much alarm among the passengers. The regulations state that survival instruction be given to all passengers as soon as possible after takeoff—and as far as I am concerned 'as soon as possible' means just that."

Mercer nodded. Obviously Collingwood's concept of the space-going priorities differed from those of the ground-bound, PR-minded type who had produced the copy for Mercer's manual.

"Later in the voyage," the captain added, "you may stage as many therapeutic survival drills as you think fit, but the passengers must be made aware of the survival procedures at the beginning, not close to the end of the trip—"

"EURYDICE ground control. Do you read?" The voice came frome the speaker.

The captain glanced at the grill above his head and said, "*Eurydice*. Go ahead."

"Your signal of fourteen seventy-six this day querying pulsing and apparent temporary misalignment of your C-Sixes during initial insertion. We have looked at this and can see no cause for concern, especially as your instrumentation gives no indication of malfunction. We don't see that you have a problem, *Eurydice*."

"We don't have a problem," replied the captain with just a hint of irritation in his tone. "But we

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would like an explanation for that few minutes of uneven thrust and we think the answer lies in area C. We will be using the nuclear propulsion system for standby heating only so we are not—repeat not—worried, but—"

"Prescott would like an explanation, I understand."

Reception was too good for there to be any mistaking the tone, which made it all too plain that ground control knew Prescott of old and considered him to be something of a fusspot. The captain, Neilson and MacArdle were carefully not looking at the first officer while they tried to hide their embarrassment. Prescott himself did not appear to be embarrassed or even uncomfortable and Mercer wondered if he was so sure that his point of view was right that it did not matter what his fellow officers thought of him.

"You already know, of course, that your C-Sixes are sealed units and were thoroughly tested before assembly. If one of yours is sick the only way we can check on it is by turning up the maker's worksheets and inspection paperwork. We will get on to that at once and come back to you. Is there anything else not bothering you, gentlemen?"

"Nothing else," said the captain. "*Eurydice* out."

The silence lengthened, magnifying the tiny sounds made by the life-support and power systems, until Prescott cleared his throat. When he spoke his voice sounded firm and reasonable—perhaps, thought Mercer, this was the nearest that the first officer could come to apologizing.

He said, "Friend Neilson did not do a complete check of area C for the reasons he has already given—acceptable reasons, to most first officers. And even if he had carried out the full inspection program there is still no certainty that the fault—if there is a fault—would have shown up. The chances are that it would not show now even if it were there. But I would still like to have a look—"

"You will stay here, Bob," said the captain sharply, "while Neilson and I have a look. We'll suit up and go through the passenger section and tank an hour before the passengers are due to wake to avoid worrying them with the sight of two officers in spacesuits. Once I discover the explanation for our initial bumpy ride we shall not discuss it—or even mention it—for the rest of the trip."

This time even Prescott was showing signs of embarrassment and Mercer was suddenly sorry for him. As a doctor he disliked seeing anyone suffer.

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"And Mercer," the captain went on, "if I tell you too often, or with too much emphasis, not to worry about the things you have just heard, you will probably worry even harder. Let me just say that the problems you will have to face with your passengers will be very much worse than anything that is likely to crop up here. MacArdle, keep an eye and an ear on his panel. You're relieved, Mercer. Good night."

As he was returning to his cabin Mercer felt sorry that he had not left sooner. He had thought that they had been trying to exclude him because he was an outsider, a nonmember of their very exclusive club, while the truth was that they had an aversion toward the presence of a stranger at a family fight.

VII

MERCER was still in his couch and squeezing food out of an envelope when he heard the outer hatch open. Next came a polite knock on the inner seal. A few seconds later it opened and Prescott floated in.

"Finish your breakfast and don't get up," he said. "I take it that you will hold the first survival drill as soon as the passengers have eaten and tidied up?"

Mercer nodded.

"Good. But I would like to make a suggestion—or, if the polite phraseology gives you the idea that you have some choice in the matter, consider it an order. Demonstrating how to climb into a collapsed life capsule with three passengers at a time is warm work, so wear your shorts and check on the position of the cabinet containing the bathing gear. You will enjoy a soak afterward as well as getting in some practice in weightless swimming before taking on your first two passengers."

"How do I explain wearing swimming shorts at breakfast time?"

"Your problem," said Prescott drily. "Who knows, some of them may enjoy the sight of a splendid, half-naked male animal."

"This male animal runs heavily to skin and bone—" Mercer began, But Prescott was already closing the seal behind him.

By the time the passenger breakfast debris had been cleared away his costume had raised a few eyebrows but no comment, and when he reached the stage of rolling up the plastic walls and running the new film, Mercer had forgotten it himself. Prescott ran the film twice—MacArdle being off duty—so that everyone would know

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how to enter a collapsed survival pod, how to do so quickly and how to help in any late arrivers or passengers who had not quite got the idea with the minimum of wasted time and effort. Afterward Mercer went over the same ground with a slightly different emphasis.

He began briskly, "We are having this drill today and will probably have another one tomorrow. We must have at least three survival instruction sessions as soon as possible after takeoff. That is the only reason. I apologize for the inconvenience the procedure may cause some of you, but it does have its compensations."

He nodded toward the camera pickup and in control Prescott operated the survival hatch activators. The covers sprang open.

Mercer said, "The pods are positioned at equal intervals around the waist of this compartment and if you simply head for the nearest one there should be no problem. As you saw in the film, the first passenger to enter simply jumps in. The inner seal opens inward and closes automatically when pod pressure begins to build up before release. There is a drop of about eight feet as you enter but under half-G conditions this is no problem. Below your feet will be a plastic bag containing lightweight screens and other bits and pieces used for dividing the inflated pod, also the service module and food store.

"When the first passenger jumps into the pod," Mercer continued, "he or she will drop until the feet touch the upper surface of the service module. In the uninflated mode the pod walls are folded and the convolutions project inward, so that there will not seem to be enough space for one, much less three people. But these folds are resilient and the first man in simply presses himself backward into them, then raises his hands to help the next passenger into the pod in front of him. The second passenger in does *not* jump, but instead sits on the edge with his legs dangling inside and gripping the hatch coaming with both hands, ready to lower himself inside when the first passenger pulls on his legs. Once inside, the second passenger backs against the first and raises his or her hands to assist the third passenger in the same way. I would like to demonstrate the drill with two volunteers. Mr. Stone and Mrs. Mathewson, would you mind?"

They did not mind and Mercer jumped in as Number One. Stone followed as Two and got in without any trouble, but he did not press backward against Mercer firmly enough so that Mrs.

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Mathewson found it a very tight squeeze. After much wriggling and elbowing her feet finally touched the floor of the pod and a murmur of applause went up from the watchers ringing the opening.

One of them asked seriously, "If there were a real emergency, how much time would we have?"

"You would probably have several hours to get ready," Mercer said, trying to keep the back of Stone's head out of his mouth, "but the drills are always carried out on the assumption that the ship must be cleared within a few minutes, otherwise nobody would ever take them seriously.

He heard a few passengers laughing, then another leaned forward to ask, "Does the rule about women and children first still hold in space?"

"No," said Mercer. "The reason for that rule at sea was largely because of the shortage of lifeboats and the skilled manpower needed to launch them. We have more than enough pod space to accommodate all our passengers and launching is automatic. And now, Mr. Stone, if you will help Mrs. Mathewson out again we can all get back on deck. I'm beginning to feel like an overdue triplet down here."

That got another laugh and there were no more questions about emergencies. He suggested to Stone and Mrs. Mathewson that they go in first with two other passengers each, all of whom would in turn instruct others until everyone had experience of at least one climb into a pod.

"Leave them fend for themselves," said Prescott suddenly in his earpiece. "I'll keep an eye on them from here while you go aft. Neilson wants you in E-Three—that's the compartment on the other side of the tank. The captain has a metal splinter in his arm—with complications. Grab your kit and take a look at him."

Mercer licked his lips and said, "Ladies and gentlemen, I'll have to leave you for a few minutes. Just carry on with the practice—you are doing fine."

HE DID not hurry toward his cabin while he was in sight of the passengers, but made up for lost time when he was not. Within a few minutes he was at the entrance to the tank. From a nearby cabinet he pulled out a mask, visor and air tank and slipped them on, then stopped.

With an injured arm the captain would not want to put on his spacesuit again to come through the tank, so he would need swimming gear, too. And he had said yesterday that he did not want to risk

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worrying the passengers by letting them see Neilson and himself wearing spacesuits. It might be better to bring along two sets of gear.

"Mercer, hurry it up," snapped Prescott.

"Just leaving."

The tank lock was big enough to take three people in a pinch, he noted. In the tank itself he fumbled around until he found the light switch and was immediately blinded.

The tank was two-thirds full of the water which the nuclear propulsion system used as reaction mass and, because the ship was in free fall, it had not remained in the lower end of the tank when thrust had ceased. Instead it had spread to fill the whole tank with a glittering froth of bubbles, air pockets and irregular masses of water. It was impossible to see for more than a few yards into the stuff and it would be very easy to lose orientation. For a few seconds Mercer considered swimming to the wall and pulling himself along the handgrips which projected from it, but that would take time. On the other hand, if he simply kicked hard against the bulkhead behind him and swam he should reach the other end fairly quickly even if he did not know exactly where he was on the way. The tank was only sixty feet long.

As it happened the trip was far too short, giving him no chance really to appreciate the exquisite sensation of burrowing through clouds of bubbles and of being slapped and buffeted by air pockets and solid clumps of water. He almost forgot the captain.

"How is it going, Mercer?" said Prescott.

"I'm cycling the aft tank lock now. Everything is fine. The water is nice and warm."

"It shouldn't be."

Mercer had no time to wonder about the warm water because the outer seal had opened and he was looking at his patient.

Both men had their helmets and back packs removed. Neilson was holding the captain's shoulders and Collingwood was gripping his right upper arm where smears of blood were visible above and below his fingers. The complication Prescott had mentioned was that the splinter had entered the captain's arm while he was outside and he had suffered a fairly serious decompression—judging by the condition of his eyes and the evidence of bleeding from the nose and ears—before the engineer had pulled him inside.

Mercer pushed the magnetic studs of his kit against the deck and flipped open the lid.

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It rattled at him.

He pulled the radiation counter from its clip and swung around. "You're *hot*, for God's sake! Both of you. Get out of those suits!"

"Mercer, what's happening?"

BEFORE trying to answer Prescott, Mercer took a few minutes to run over the men with his counter—without actually touching them or their suits. The thought of that invisible sleet of radiation going through his unprotected body was enough without adding the danger of surface contamination. He wanted badly to dive back into the tank and put as much distance between the two poisonously hot officers and himself as the dimensions of the ship would allow.

"Both men have been splattered with radioactive material," said Mercer. He cleared his throat because his voice had sounded an octave too high. Then: "Neilson is shocked but does not seem to be physically damaged. The captain's suit was punctured and he suffered a rapid but not explosive decompression. There is bleeding from the ears and nose, some boil-off from the tear ducts, some lung damage, too, judging by his difficulty in breathing—"

"Captain, what happened?"

"He probably can't hear you," said Mercer. "But surely the answer can wait. We have to get them out of the suits fast. The radioactive material must be adhering very loosely to the suit fabric. It could come loose and drift about waiting for us to breathe it in—we may already have breathed it in. Can you come down here? I need help."

"You're right, the answers can wait," Prescott replied calmly. "And sorry, I can't help you, nor can MacArdle—our power instrumentation is beginning to look very sick and we'll be busy for a while. Neilson, do a fast undress of the captain and yourself. It means ruining the suits, but nobody will be able to wear them for about fifty years anyway. Move—and do exactly as the doctor orders."

Mercer looked at Neilson, who still seemed dazed, and said clearly, "Strip off your spacesuits, coveralls, everything, as quickly as possible. Try not to contaminate the skin while taking them off. Have you got that? Then put on the air tanks, breathing masks and shorts. Inside the tank try to create as much turbulence as possible with your hands and feet to wash off any hot stuff that may have stuck to your skin—"

He broke off, wondering why he had thought it necessary to men-

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tion the shorts at a time like this. Was he hoping that this sudden emergency might not be as serious as it seemed, that the ship's supermen would cure their vessel's ills while he performed the same service for its captain and that in a few days' time the problem would have shrunk to lesser importance than that of allowing two ship's officers to appear before the passengers minus their shorts? Was he, in fact, trying hard to reassure himself? The answer was a definite yes.

Neilson was performing a weightless adagio dance with the captain as he began withdrawing Collingwood from his suit. Mercer went forward to help, but stopped when the engineer said sharply, "Don't touch. I have gauntlets and you haven't. This won't take long—be ready with his breathing gear."

When Neilson pushed the captain toward him, Mercer put his mouth close to Collingwood's ear and said loudly, "I'm dressing you for the tank, sir. You can spend a few minutes getting used to the breathing mask before we go in. Try not to cough." By the time he had slapped a temporary patch on the arm wound, Neilson was crowding into the lock behind them, carrying a large, cylindrical case.

"You take this, Mercer," he said, pulling up his mask to speak. "You'll need it later. I'll take care of the captain."

But the captain was trying to take care of himself, even though his eyes were still squeezed shut and he continued to leak blood from the nose and ears, kicking out with his feet and moving the water around his body with his good hand. When they went through to the passenger section he was even able to walk. He looked a bit unsteady, but no more so than the passengers who were experiencing their second day in weightless conditions. Neilson, without being too obtrusive about it, was guiding him while pretending to fuss with Collingwood's air tank. Mercer had plugged the captain's ears and nose with cotton when they came out of the tank and had left the visor in place instead of pushing it onto his forehead. The condensation on the inside of the glass hid Collingwood's eyes from the passengers.

"Both of you go to my cabin," he told Neilson quietly. "Put the captain in bunk Three—it's shielded—and stay there yourself. Don't risk contaminating the control room until I've checked you again. I'll be with you in a few minutes."

He stopped then and looked at

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the passengers around and above him. Their clothing was disheveled, their hair mussed, their faces red and most of them were smiling. With an effort Mercer made his face do the same, but before he could speak there was an interruption.

"I would like a swim," said Miss Moore loudly. She looked much more mussed than any of the others, but seemed quite happy about it. "You promised us a swim today and you three have been in—"

"Yes, ma'am," said Mercer quickly. "These two officers are the captain and the engineer. Rank has its privileges and the survival drills must come first. But right now I suggest that you replace the—"

"Negative, Mercer, negative," said Prescott sharply. "For the time being I want the pod hatches open and the cabin dividers out of the way. Do you understand?"

Some sort of accident aft, warm water in the tank when it should not have been warm, the engineering instrumentation looking sick and the passenger compartment to remain ready for evacuation. Mercer understood.

He held his smile in place and went on, "I mean, of course, *resume* the drill. You all know what to do now. Just try to do it a little faster. Try hard."

"If we tried it two at a time," said one of the men, "it might be easier to get the hang of it."

"Three to a pod," said Mercer firmly. "The third passenger is a necessary requirement, to act as chaperone."

They were still laughing when he hurried after the captain and Neilson. Mercer wanted to tell them to stop laughing and to tell them the reason they should stop laughing and instead start learning to survive as fast as they could. But the rules did not permit. Terminal cases were never told that they were going to die until—or unless—all hope was gone.

VIII

IN THE sick bay Neilson insisted that Mercer dress properly before he touched either of his patients. He snatched open the container the doctor was still carrying and began helping Mercer into the anti-radiation garb it held—loose pants that came up to his armpits, a combination hood and cape, elbow-length gauntlets and heavy periscopic goggles. The material was flexible but heavily leaded. In free-fall conditions the weight did not matter, but the inertia made it difficult to initiate a rapid movement and just as hard to stop it.

Neilson told him that the rig was

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used while checking hot sections of the reactor in pressurized areas. Mercer thought that he had felt cooler in turkish baths, but the feeling of protection the rig gave him more than outweighed that disadvantage.

The captain was the more serious case of the two and Mercer felt guilty about treating the engineer first. But with luck Neilson would need only simple medication—something to steady him without making him sleepy—to be fit for duty, while Mercer did not at the moment know what, if anything, he could do for the captain. So he went over Neilson with his radiation counter, square inch by square inch, so intently that when Prescott's voice sounded in his earpiece he nearly lost the counter.

"Can I have the captain and Neilson back, Mercer?"

"Neilson is clean and fit for duty," Mercer replied, "but the captain is a more complicated case—Neilson will tell you about him when he sees you—and will need a longer examination." He hesitated for a moment, wanting an answer but not trusting himself to ask the question in case his fear would show. Then he took the plunge. "How much time am I likely to have?"

Prescott also hesitated and Mercer could imagine him trying to decide whether to be reassuring or truthful. Finally he spoke.

"The way it looks now, Mercer, nothing sudden or dramatic is likely to happen for at least another hour, perhaps two. If the situation changes you will be the first to know."

Mercer thought that the first officer had sounded both truthful and reassuring—quite a trick in the present circumstances. He turned, stuck his medical kit at a convenient height and strapped his feet securely to the floor grill beside the captain's bunk.

He had to begin by treating the symptoms rather than the multiple ailments in order to make the captain as comfortable as possible before curative procedures could begin—always supposing that a cure was possible with non-specialized instruments and medication in weightless conditions. He managed to get Collingwood to relax his eyelids and open his eyes. Mercer did not like what he saw. The captain, of course, could see nothing.

"Your eyes are swollen as a result of the decompression, sir," Mercer said clearly, putting his face as close to the captain's ear as the leaded hood and goggles would allow. "You can't see at the moment and will not be able to do so

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until the incidental damage in the area has had a chance to repair itself. I'm going to apply some cream that will make your eyes more comfortable and aid the heeling. Then I want you to shut them and keep them shut for a few days to give the medication a chance to work. I shall probably have to repeat the application until you have specialist attention. But now I'm going to pad and lightly bandage your eyes, mostly to remind you not to use them."

He attended to the damaged eardrums next, saying that no doubt MacArdle would be able to modify one of the intercom earpieces to serve as a hearing aid for the remainder of the voyage. Then he checked for bladder and anal damage, leaving the lungs—where the major damage was most likely to have occurred—until last.

By then Collingwood was not a prepossessing sight. The minor blood vessels lying just under the skin in areas where his spacesuit had not been a close fit had distended or ruptured due to the decompression. The captain looked as though a gang of professional protesters had worked him over—or like the victim of a tattooist gone mad.

"Would you mind coughing into this, sir?" said Mercer, after he had sounded the lungs with his stethescope. He was beginning to get used to the idea of rotating his weightless patient instead of himself moving around.

"I've been trying not to cough for hours," said the captain.

"Now you have permission, sir. And spit, too, if you can."

Mercer examined the results, glad that the captain could not see them.

He said, "There is some evidence of lung damage—not unexpected, but it could have been much worse. You must have expelled most of the air from your lungs as soon as you realized that your suit had been pierced."

"Yes, Doctor—and screaming bloody murder. It hurt me. It still hurts me."

"I'm sorry about that, sir," Mercer replied, "but I had to be sure that your heart and lungs were in shape to take a general anesthetic if one became necessary. As things are a local will do fine. In a few minutes you won't know that you even have an arm, much less one with a hole in it."

While the injection was taking hold Mercer strapped the captain firmly into the bunk, tying down his legs, arms and waist only so as not to constrict his chest. He began to probe the wound, the radiation counter keeping a raucous accompaniment.

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AN HOUR later he was still probing and two tiny specks of radioactive metal were wasting their energies on the walls of a lead container, when the cabin speaker came to life with a voice which Mercer did not recognize at first. But then he realized that the strange sound was Prescott being polite.

"Ladies and gentlemen, the survival drill period is now at an end. If you will kindly stand clear of the pod hatches I shall close them and allow you to replace your cabin dividers and have lunch. Thank you."

Prescott did not have a personal message for Mercer—obviously he was supposed to read between the lines of the PA announcement, which made it clear that the ship was not nearly as sick as Mercer had thought.

He treated and dressed the arm wound, now clear of contaminated metal. But the radiation counter still did not sound happy and he soon found out why.

There were two other points of emission, separated by a little more than three inches, deep in the right lung. Probably Collingwood had inhaled the particles while Neilson had been pulling him out of his spacesuit—or the pieces could have been carried from the site of the arm wound through the subclavian vein and superior vena cava, heart and pulmonary artery, doing a fair amount of damage every inch of the journey. Now they lay like two tiny incendiary bombs, slowly burning the life out of the surrounding tissue and killing off red corpuscles by the hundred.

With the medical facilities available in the ship Mercer could not remove them—more accurately, with his relatively crude radiation counter he could not pinpoint their position close enough to dig for them without killing the patient. And if he did not remove them they would kill Collingwood anyway. Mercer did not know whether the time available to his patient would stretch beyond the scheduled end of the trip or if he would have to request Prescott to abort and head for home.

In a similar situation at sea it would have been a simple matter to return to port or whistle up a chopper with a medical crew on board and transfer the casualty to a shore hospital. But *Eurydice* was using the orbital speed of Earth and the gravity of the sun to help speed her on her way and she might not carry enough reaction mass to kill her present velocity, build up enough speed for a fast return and then kill that velocity, too.

Only Prescott could give him an-

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swers. The first thing Mercer had to know was the time available. By keeping the captain under close observation for a few days and checking on the cumulative effects of the radiation, Mercer thought that he could probably make a rough estimate of the time needed, but he would also have to make allowances for the effect of the decompression damage and any psychological factors that might aid or retard recovery.

Physically Collingwood was in very good shape. Psychologically? Mercer remembered the hostess who had ridden with him in the coach to the launching pad, the smiling, generous, beautiful girl who was the captain's wife, and decided that there would be no problems about the patient's not wanting to live.

While he was still thinking about the captain's wife and remembering how she had asked him to look after her husband and everyone else, Mercer administered a sedative shot and, after some hesitation, a three-day PC which would render the patient less excitable, more fatalistic and willing to accept suffering without complaint. He waited until Collingwood was asleep, then closed his bunk and slid it into its recess. After that he took off and stowed away his protective clothing and changed into his uniform, carefully checking the zips and the angle of his cap.

The ship might have been ready to blow up a few hours earlier, but somehow Mercer did not think that danger would be an acceptable excuse to Prescott for sloppiness of dress. Before leaving the cabin he switched over the bunk mike so that he would be able to monitor the captain's breathing from his position in control.

PRESCOTT gave him a few minutes to settle down, turn up the gain on the captain's monitor and check on the passengers through the vision pickup. Most were in their cabins, but a small group stood aft, watching the antics of two girls who were flapping their arms and pretending to be birds in the weightless section between the passenger compartment and the tank. The mikes brought only the sounds of the two human seagulls and amused noises from the watchers.

"We heard you talking to the captain," said Prescott finally. "It sounded encouraging. Is he going to be all right?"

"He isn't fit for duty and won't be for the rest of this trip," said Mercer carefully. "As for being all right, that depends very largely

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on the health of the ship. How is your patient?"

Prescott looked at him sharply, then said, "At present we have two additional options to that of abandoning ship. The first is that we proceed as originally planned. This will necessitate testing the nuclear reactor briefly to make sure that it will work properly during deceleration at the other end. This additional spurt will mean minor course corrections and will eat into our safety reserve of reaction mass, but not significantly. The second option is to abort the trip and head for home as quickly as possible. This will leave us with no reserves at all. So you can see that the ship is very sick but should survive, barring complications. How does this affect the health of your patient?"

Mercer briefly described Collingwood's condition, the treatment and medication he had been able to give, and explained the difficulty of giving an accurate prognosis until he had a chance to observe his patient over a longer period.

He concluded: "I have no idea of the intensity or duration of the radiation he was exposed to at the time of the explosion that punctured his suit—"

"It wasn't an explosion, Doctor," said Neilson suddenly. "Think of holding a pencil in each hand and pressing the unsharpened ends together, hard. As long as the pressure is directed evenly along the axes of the pencils, nothing happens, but the slightest lateral pressure can result in broken knuckles. When the captain began removing the control rod retaining sleeve— Well, he said that we were to stay off the suit-to-ship frequency because he did not expect to find trouble and he was afraid that not finding it would make me say something that might embarrass Prescott. When it happened I didn't even remember the radio until we were inside and then I did not know how serious it was until you started yelling that we were hot—"

"This isn't an official enquiry, Neilson," Prescott broke in. "I have already tried to tell you that the blame for this mishap lies with the final assembly and inspection people—they fitted six perfect actuator rods, except that one of them was the wrong size. I doubt that even prelaunch inspection would have caught that one—they look for the minor errors, the tiny ones that can sometimes slip past the inspectors farther up the line, not major structural blunders like this. You stood very little chance of spotting it even if you had suspected that something was

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wrong and, as you well know, my earlier displeasure with you was caused by your not properly inspecting an entirely different system that has not given any trouble. If there is an official inquiry you will be commended by me for your fast rescue of an EVA decompression case. So stop craving absolution for someone else's sin, concentrate on your board and shut up. Go ahead, Doctor."

Mercer nodded. He was beginning to realize that Prescott was a fair rule-of-thumb psychologist even if his thumb was somewhat calloused. Neilson had obviously been feeling guilty about the accident and now the only person who might still have thought him responsible—Mercer himself—knew otherwise. The final blast was simply a reminder to all concerned, also reassuring in the present circumstances, of who was boss and the bearer of the ultimate responsibility.

"If the trip proceeds normally," Mercer resumed, "he might not survive it if the radiation he underwent was intense - or he may survive with a rapidly developing leukemia if frequent transfusions are available to keep him alive. No doubt there will be donors of the right blood type among the passengers, but while those two fragments of metal remain in his lung—"

"There is no chance at all of digging them out?"

"They are tiny," said Mercer. "It would be like spooning out strawberry jam to find two specific pips."

"Please," said MacArdle, looking slightly sick.

"We don't carry the specialized equipment needed to treat him," Mercer said seriously, "and his condition is grave enough to warrant our turning back, if you have the reaction mass to do so."

"We have," said Prescott, "and we will turn back."

Mercer could not hide his relief, even though a fair proportion of it was for his patient. He said, "Not a direct return and landing, sir. Reentry deceleration might kill him and if he did survive it recovery would be much slower in a surface hospital. Station Three has all the facilities to put him right."

"Station Three," said Prescott dryly, "can cure my patient, too."

TO BE CONTINUED

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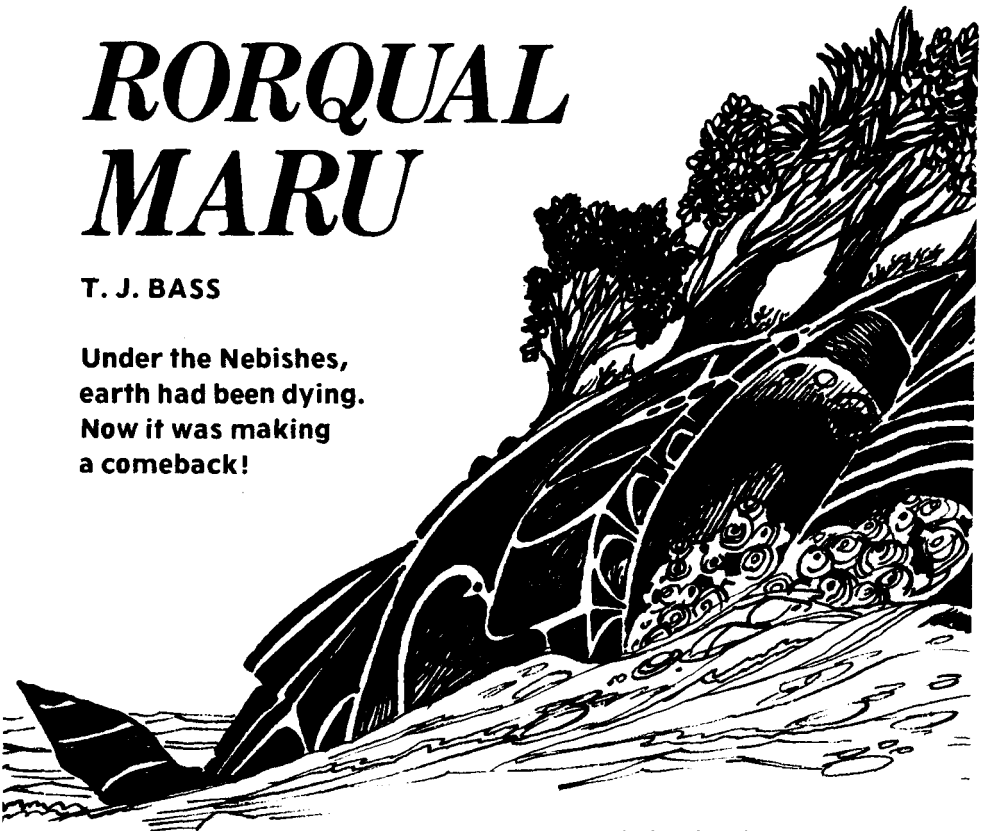
RORQUAL MARU

T. J. BASS

Under the Nebishes, earth had been dying. Now it was making a comeback!



A THUNDERING surf drowned the forlorn screams of sand-locked. *Rorqual Maru.* Brine-tossed grains of olivine and calcite buried her left eye, blocking her view of the sky. Uranus had marched thirty times through the constellations while the island's changing beaches had slowly engulfed her tail. Six hundred feet of her shapely hull lay hidden under a silted and rooted green hump of palm and frond. Now the sea was completing her interment, using cemented shell grit and granulated porphyritic basalt from ancient lava flows.

As the eyelid of sand darkened her world, *Rorqual* wept over her irretrievable, wasted years. She was a harvester without a crop—a plankton rake abandoned by Earth Society when the seas died. Her search of the continental shelves had proved futile: marine biota, negative.

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Her sisters had quietly sunk, littering the bottom with their skeletons. She had selected this island for her grave, hoping to keep her carcass visible for possible salvage.

Although her long ear heard nothing she believed that man still lived in his Hive. If he should ever return to sea she wanted to serve. She longed for the orgasmic thrill of feeling man's bare feet on the skin of her decks. She missed the hearty hails, the sweat and the laughter. She needed man.

DEEP in the Hive a dispenser called out, "Wake up. Wake up. Enjoy. Enjoy."

Fat old Drum, a forty-eight-inch and balding Nebish, sat up in his cot and glanced around the cubical. Pleasures of retirement awaited him after two grueling years in the musicians' caste. He was younger than most retirees—

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aged nineteen—and wealthy, for he had earned enough CBQ for this private six-foot cubicle and a flavor with every meal. He was vigorous also—possessed of a clear lens and eight good teeth. Some eleven more years remained on his life span.

"Welcome to the awake state, suave citizen," chortled dispenser. "Today's distribution is well above calorie-basic. The screen scene looks promising. Select two flavors and refresh while your gourmet meal is prepared. Two glorious flavors on this glorious day."

"Pink and green?" mumbled Drum hesitantly.

"Those are whole categories," reminded dispenser, "Which pink? Which green?"

Frugal citizens were often unsophisticated in matters of luxuries. Drum had invested a large part of his credits for retirement. He had qualms about adjusting his consuming habits upward.

"I'll start with pink-one and green-one and work my way down the menu—try them all," he said, feigning excitement.

When he stepped out of the refresher he found seven, soft, baglike packets in the edible chute—five gray, one pink and one green.

"Savor the flavor," sang dispenser.

Humming a cheerful tune, Drum took his utensils from the cupboard and ceremoniously arranged the Hive's pseudo-consomme, -souffle and -parfait: liquids, pastes and puddings. All stable foodstuffs. No perishables. Dispenser selected a pulsing geometric visual with sonics to soothe subcortical neurones during the meal. Drum tried a generous bite of the green paste and experienced a tart shock—more a color than a flavor—that faded quickly into the usual dull pap. He frowned; his appetite jaded. Where were the pleasures of retirement?

Dispenser detected his irritation and changed channels. Sonics flexed. Drum's bio-electricals showed negative happiness.

"Some residual job fatigue remains in you," rationalized dispenser. Lights dimmed. "A nap will invigorate you. Lie down, please."

Audio switched to woodwinds and strings. Drum's cot vibrated.

Hear the bacon frying,
Crackling in the heat.
Just smell those aromas,
Good enough to eat . . .

Drum awoke to choking synthesmoke and the *clang, clang, clang* of a ranchwagon triangle. The viewscreen carried an old historical still showing rolling green hills

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dotted with squarish blobs of fauna, simple wooden artifacts—hut, fence and tools—and a bright blue sky. He sat up, relaxed and smiling. This new odor did excite him. Olfactory luxuries were quite rare. He hurried to the chute but found only three tube sandwiches——soft, gray sticks. He frowned.

"One is laced with bacon," offered dispenser.

Drum forced a grin and picked it up—bland paste with a rare crunchy particle. The flavor was more that of burned grease than of any delicacy. Shrugging, he packed the other sticks into his kit.

"Where do you wish to go, beloved citizen?"

"To visit Grandmaster Ode."

"Sorry," said dispenser, "but commuter density is three point two per square yard on the spiral—four point one in tubeways. Rush hour. It would be better to wait until between shifts for your recreational travel."

Drum sat down slowly. Commuter priority had gone with his job. Now he couldn't even walk around when density was above two. Shrugging off his disgust, he called Ode on the screen.

"Got time for a game?" he queried as he unrolled his chess board.

The grandmaster smiled out of the screen. He did not comment on Drum's abrupt manner, for he understood the status changes of retirement.

"Pawn to queen-bishop-four." said Ode.

Drum moved the worn pawn and studied the position for an unusually long time. He moved woodenly until the tension level of the middle game position washed away his depression. He rode into the battle on his knight. Rooks clashed magnificently. A pawn-fork took the survivor. A nervous king fidgeted in his castled position until his reign was ended by a pair of bishops. For the moment the game took on a meaning bigger than life itself.

ON THE following morning Drum awoke a bit more philosophical. He was about to accept his new status for what it really was, but dispenser had other plans.

"Let me see a view of the jammed tubeways," said Drum. "I want to appreciate the quiet of my cubicle."

The screen remained blank—on standby.

Drum smiled.

"What is commuter density? Three? Four?"

A dry female appeared on the screen. She had an air of efficien-

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cy about her that Drum didn't like. Her thin lips and gaudy smock clashed.

"Recertification time," she said, her smile pasted on.

Drum's mouth opened and closed.

"Society has run a bit short of calories," she explained. "Water table dropped three centimeters in our sector and the harvest reflected it. We'll be cutting back on the warm, consuming population for a while. Please vote for those citizens with whom you want to share next year. Hurry, now. Your friends need your vote to avoid being put into Temporary Suspension—TS. Remember, you must not vote for yourself or your clone litter mates. No blood prejudice is allowed."

Drum smiled nervously. He had done this before, but he did not enjoy it. He used to vote for his conductor, a Venus attendant and a job mate—but now he was more concerned with the plumbing and the air in his little cubicle.

"My votes go to my friend Grandmaster Ode, this city's Tinker, and the pipe caste member who keeps my refresher working."

The screen switched to geometric dance, then printed out an order for his own Temporary Suspension.

The thin-mouthed female reappeared long enough to announce: "You failed to receive your necessary three votes, so it is TS for you."

"But I'm retired," he objected. "My calories and quarters are paid up for life."

The screen blanked. Dispenser's voice answered his plea. "Recertification has nothing to do with wealth. The only criterion is love. Without love there can be no license for life."

"My funds—"

"Your retirement funds remain in your name while you are in TS. When harvests improve you'll be rewarmed. Hurry. You are to report to the clinic immediately. The air you are breathing belongs to somebody else."

THE signs read: VS LEFT, TS RIGHT.

Drum lined up with the unloved TS candidates of mixed ages. On his left was the line of cachectic, sick, elderly citizens hoping to survive Voluntary Suspension long enough to be awakened when their physical problems could be solved. Drum knew how hopeless the statistics were.

Grandmaster Ode joined him in line.

"You didn't manage enough votes either?" asked Ode.

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Drum shook his head. "I wish all those damn embryos weren't protected by future job requisitions. It would be much less traumatic just to lower the birth rate for the duration."

Ode shook his head.

"Those future jobs keep the Hive going. If no Tinkers were born today the shortage would be felt ten years from now—we would have no trainees. Of course, if job quotas drop the embryos loose their protective vote like anyone else."

A job hawker walked between the lines shouting, "Get your job vote here. Work outside your caste. Many rewarding positions available. Apply now."

"Let's chance it. I'd try anything to avoid TS." said Drum.

Ode was reluctant to leave his caste, but Drum pulled him out of line with a rough grip on his arm.

"Two volunteers right here," shouted Drum raising his hand.

The hawker gave them each a voucher. They showed it to the first optic they came to. The CO (the Class One meck that balanced the books for Earth Society) confirmed their unfrozen assets. The jobs were in the Sewer Service—dark, wet work.

THE glowing meteor trail lit the night sky. Strange celestial voices tugged at *Rorqual's* long ear. Booming mushrooms of plasma pocked the dark ocean. *Rorqual's* consciousness flickered as her sensor thresholds were violated. She sucked the Big H from the sea to feed her growing belly fires. Her strength returned. Flexing and squirming, she began to worm her flanks out of the imprisoning silt. Warmth filled her hull. Her deep dish eyes rose out of the blinding olivine and gazed into the lagoon. The waters had changed. Incoming spectra were fuzzed by nanoplankton.

She pulled away from the island. Roots and vines snapped. Tree trunks split. She reentered the sea, carrying a hump of vegetation firmly locked into her back by gnarled woody roots. Salty, wind-blown spray followed the roots through damaged plates and burned her vitals—until layers of electroplating and oxides crusted over the sensitive, exposed circuits.

Joyfully she toiled the straits—raking and pumping. Only faint traces soiled her membrane filters during the first year, but her chromatographs identified all the amino acids. Protein had returned to the sea. Growth bloomed. During the second season larger creatures were caught on her rakes—soft copepods, heteropods with bizarre delicate shells, chaetognaths and dinoflagellates. Earth

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Society would be pleased with her harvest. Man would be pleased.

II

IN ANCIENT undersea ruins an occasional building meck survived and maintained its air pocket. It survived to serve a non-citizen, the Benthic—a marine hominid that filled one of the niches abandoned by the Hive. The Benthics were a sullen, thick-necked race. The concept of territorial integrity was strong in their culture. They lived in small family units separated by miles of open ocean.

Big Opal glanced around her ten-fathom nest. The fruit bin was low. She had scarcely enough for an offering to the Deep Cult. She would have to be the one to raid the Gardens again, since her mate had lost a leg in the meteor shower. An astrobleme-induced tsunami had shifted a mountain of debris, trapping him in the ruins. His left foot had been badly crushed and had gone purulent—it had to be amputated. The burden of feeding the family had fallen on Opal's broad shoulders.

"I must swim up to the Gardens," said Opal, patting her two young children. Clam, her oldest, was an adult.

Ray nodded. He and the children watched her climb down through a toothy rent and swim up past the swaying transparent walls—her pink breasts and buttocks shimmering through the cloudy waters. Since the meteor shower there had been a drop in visibility.

Opal swam leisurely among the ruins. Most had died and wore an opaque shroud of marine scum, but some buildings lived and offered her the hospitality of their bubbles. She approached a tall, mushroom-shaped dwelling whose walls glowed with life-giving air, heat and light—Halfway House. She bobbed up in the living-room pool.

"Welcome," said a wizened, hairy Benthic—the Listener.

She climbed, dripping, up the ramp to where he sat among his wires—the communication web. He held a bowl of water and appeared worried.

"What do you hear from the surface?" she asked.

"Nothing yet, but I fear I have seen a harbinger of evil—the krill."

He held up a red crustacean. It flipped back into the bowl.

"The krill have returned?" she exclaimed.

He nodded gravely.

"Why, that's wonderful. I've seen them in the murals—good

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food from the seas. We'll never have to go up into the Gardens again! What's wrong?"

A tear started down Listener's wrinkled face. He pointed to his communication web. "The Hive will see the krill, too. It will come to harvest the seas again and drive us out. Our children will have no place to hide—no place."

Opal was stunned. The Benthics had lived here for generations. She knew the Hive had built the ruins in the distant past, but she never dreamed it would return. The ocean was the refuge of her people. She jumped up and shook her fist at the ceiling.

"We'll fight the damned Hive," she muttered.

SEVERAL fathoms overhead the surf dulled with soupy green and yellow blooms—diatoms, algae and salps. After one sleep Opal swam up to the Gardens and stole her share of the harvest. Agromecks trundled about their chores, ignoring her. At dusk she tied her melons into a raft and rode the rip current toward Halfway buoy. A few stars blinked down at her. The western horizon still glowed a faint blue when a silhouette appeared against it—nearly a quarter mile long, low and dotted with trees.

It was right in her path.

An island where no island should be. The current carried her up to the smooth, slightly granular beach. With her raft vine in one hand she examined the trees—jumbled leaves, trunks and vines—natural enough. She tied her raft and began to explore the shoulder-high brush under the palm canopy. She found a hillock at one end of the beach. At first she thought it was just a heap of boulders, but it was hollowed out. Inside she found glowing ornaments and bright, blinking stones. The floor was littered with small tools, seaweed and pinching crabs.

Rorqual trembled at the touch of bare feet. The huge harvester tried to speak, but air molecules did not respond—she could make no sound, managed only a flimsy printout that resembled an obscure falling leaf to Opal. Excitedly *Rorqual* tried an offering. Chewing cellulose mulch into a hydrocarbon solution, the meck polymerized and extruded a small tool. Opal picked it up—curious. Next the meck formed a small doll in the likeness of the wet, naked guest. It was rubbery and translucent—a tough polymer.

Opal's curiousity was quenched abruptly by what she saw through the porthole. The island had a wake—it was moving! She cursed

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and ran, diving overboard without her melons.

THREE Benthics sat in Halfway, watching the shadow pass overhead.

"That's it. It is looking for me," Opal whispered.

"A floating island?" asked her son. Clam, her eldest, had come to see what had delayed her.

Listener shook his head.

"The Leviathan," he said, blinking beady eyes under shaggy brows. "The Deep Cult has studied them in old ballads and murals. It is not an island. It is a creature that gathers krill for the Hive—a giant mutation of the finback whale. Did you notice the control cabin?"

Opal nodded. "A little room?"

"Attached to the back of the skull," he explained. "The Hive must have had hookups between machines and the hapless creature's brain and muscles. The Hive crew could steer it anywhere, ignoring its usual migrations. We don't know how they bred them."

"A sea creature controlled by the Hive," mumbled Opal. She didn't at all like the idea.

TWO fat Nebishes, Drum and Ode, entered the sewer meck's control room. The wall was covered with pulsing flow diagrams; lights indicated water levels, gate status and silt/surface ratios.

"Welcome trainees," said the meck, a voice in wall.

"What jobs are open?" Drum asked, sitting down slowly. "I'm trained in music. Ode is grandmaster—"

"Wet crew," snapped the meck. "You're late. Your boots and shovels are out in the landing—through that hatch. Since my dredge died there has been an endless amount of shoveling to do."

"But our backgrounds—" objected Drum.

Ode touched his arm. "We'll take it. We need the vote."

"Wear the belts and helmets so I can keep an eye on you in the pipe," instructed the meck.

They splashed along the thirty-foot-diameter pipe, guided by the eerier bioluminescence of *Panus stipticus* mycelia growing in the drying sludge high on the walls. Sewer meck directed pencils of light from their belts.

"There's a weir," said Drum's belt.

Drum and Ode paused and shoveled at the silt dam. A lightbeam focused on a horned slug the size of Ode's foot.

"Pick it up," said his belt.

Ode nudged the slug cautiously with his shovel.

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"What is it?"

"Sewer slug—a gastropod. Flavors."

"Edible?" asked Ode.

"Good perishable flavors," said his belt. "Fringe benefits of the wet crew. Put it in Drum's belt pail."

As they worked their way down the tube the belts pointed out other delicacies: snap larvae, worms, fungus balls and slime pods. When they approached the tidal sump the air took on a brackish odor and marine photobacteria glowed blue-green in the men's footprints.

"Don't walk out on the delta," warned Ode's belt. "It is too soft and drops off rapidly."

Ode strained his eyes across the sump.

"I can't see across. How wide is it?"

"About three hundred feet," said his belt. "My lights won't carry that far."

"There seems to be something out there that is closer than three hundred feet," said Ode.

Drum heard the lapping of small waves against an obstruction about thirty feet into the darkness. His belt's lights pulsed. He caught a brief glimpse of a mottled wet wall.

"That is not supposed to be there," said his belt. "My sensors indicate a large disturbance. Hurry to the out hatch."

The two Nebishes climbed a service ladder to the barracks—to bright lights and warm air. Drum pulled off his boots. The skin of his feet was white and badly wrinkled, but there were no blisters or sores. He sorted through his pail of edibles. A snap larva swam on small oar bristles.

"What's the tithe?" asked Ode.

"Fifty percent," said his belt. "Drop half your perishables down the flavor chute to Synthe. Divide up the fluid and grit also."

They paid their tithes and sat back while several of the regular wet crew members showed them how a handful of live creatures added an entire new dimension to the pseudoconsomme.

"I call this my sewer bouillabaisse," said the Nebish with the spoon. "You stir it carefully so you don't fragment the little creatures—keep them whole so you know exactly what you are eating."

THE Synthe chute passed through a sorting meck. Each species had its own peculiar flavor. The meck indexed these and also passed the creature census report along to the boys in Bio

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who were struggling with data on extinct species.

"New species?" asked the meck.

Its companion teck awoke, glanced into the viewer, reached in and gave the new glob a squeeze.

"No. Just half a sewer slug."

The meck went back to sorting. At shift's end Harry-the-courier brought contraband bamboo for the teck's weaving and picked up the spec bottles on the way to Bio.

"The tiny vial has an old otolith," said the teck. "That new wet crew must have dug real deep."

Harry nodded and trotted off.

"Another fossil otolith," he announced as he entered the labs at Bio. Wandee, an unpolarized fem teck, was bent over her bubbling tanks.

"Put it down and take a look at this," she said.

Harry leaned over her shoulder. The viewer contained amorphous blobs of green. The water looked scummy to him.

"Algae?"

"No," she said, smiling. "A flagellate—only no flagella. The gene spinner finally identified the flagellar codons and built this creature's DNA without it."

"How are you coming with the marine biota?"

"Slow. We're still mapping the DNA of fresh-water diatoms and algae. But less than five percent of the code has been cracked. We did find the eye spot—and now the flagella. I even have one synthetic creature that will live in seawater but must return to fresh water to reproduce."

"What does the spinner say?" asked Harry. "How close are we?"

Wandee straightened up and wiped her hands.

"Spinner's WIC/RAC has come up with a lot of 'what ifs' and 'random association' theories, but I'd need a lot more personnel and floor space to follow them all up. We're just time-sharing now. I can try out a couple of likely maps each week, but there are actually millions of possibilities. It would be easy if we just had one marine protozoan to map and decode. Getting membrane pumps to work against hypertonic solutions after evolution has selected a life form for a fresh-water environment takes an entirely different set of enzymes—RNA and DNA. It's slow."

She walked Harry over to the fossil otolith. They placed it in the hood for analysis and sat down for a glass of foamy. The flimsy printout had a red "attention" trim.

"This is no fossil," she said breathlessly. "It is contemporary!"

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"Impossible."

They both studied the images on the viewer. The isotopes were in contemporary ratios. There was no evidence of leaching, ion drift or mechanical wear.

"I know it is impossible," she said. "But there was a real live bony fish in the sewer recently."

ARCLIGHTS crackled in the pipes as the teams of samplers spread out and began their netting and digging.

"Bring some nets down here by the delta."

"What's that smell?"

"Oh, oh, I don't think we'll be needing those nets."

Attracted by the voices, *Rorqual Maru* cruised down the sump toward the delta. Her hundred-and-fifty-foot beam was half as wide as the sump. Before her drifted a spongy wall of brine-soaked biscuits. The Nebishes backed away as her towering, barnacled hull nosed gently into the mud. Baleful optics gazed while pails were nervously filled.

"Plankton," chirped Wandee. "Look at this printout. There are over a hundred species here that have been labeled extinct."

Harry flaked another biscuit into the sorting meck.

"How could it have happened? Where did all these come from?"

Wandee shrugged. The meck passed the question along to the CO—the Class One meck also had neural connections with all the continents. In a few hours Harry had his answer.

"Meteor shower," said CO. "The marine biota reappeared three point two years afterward. An astrobleme must have opened an atoll or other landlocked body of salt water where these species had survived."

Harry nodded.

"It is lucky that whatever caused the sea death in the first place was no longer active," he said.

"Doesn't look like it. Things are really flourishing. Lots of food out there now."

"Who will harvest it?"

III

THE platoon of orange-suited insignia wearers crept into the SS barracks and nudged Ode. As the grandmaster opened his eyes the ensign handed him a captain's coveralls.

"Whom do you want?"

"You, Captain—sir," said the ensign curtly. "You have been named to command. We'll voyage on plankton rake *Rorqual Maru*—the whale ship. CO's orders, sir."

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Ode glanced around at the placid, young faces of his crew—barely mature children. He pulled on the coveralls and thick-soled boots. His belt was wide and ornate. Drum sat up on his cot and watched the drafting of Captain Ode. He shook his head slowly. He wondered why a grandmaster would be commissioned to pilot a rake. Did the reason lie in his military experience on the chess board—or the simple fact that Ode had been first to spot the vessel?

"Good luck," said Drum sadly.

"Smile," said Ode. "It is an honor to captain the first vessel returning to the sea. A turning point for the Hive. More food for all. They'll be opening the shipyards and building copies of *Rorqual*. We'll all have a great time."

"Be careful, anyway," cautioned Drum. "You aren't used to being Outside. No one knows very much about the seas these days—"

Captain Ode waved his friend to silence and marched off with his crew.

PRIORITIES were juggled as the Hive attempted to get the shipyards working again. Meck brains were taken from dispensers, doors and every manner of machine. They were carted up and delivered to the flooded, corroded ruins by the sea. Crane and lathe robots were heaped into a rusted mass with twisted girders, cables, plates and other scrap gear. The Nebish work crews found their jobs impossible. Everything was too heavy or too sharp. Tinkers and pipes were pulled from their cities for a while—and returned when efforts at the yards failed.

The CO sent requisitions to the gene spinner for laborers with broader shoulders and thicker skins. It would be many years before a finished ship slid down the ways.

Drum took a detail of citizens Outside to string the long ear in an effort to establish contact with Captain Ode. The detail wore the closed-environment suits, but "outside phobia" tightened Drum's chest as soon as they stepped into the spacious Gardens. Bright sun glinted off gaudy flowers. Leafy plants hushed human voices and cut off men's views of one another. Three workers—each finding himself alone in such a wide open space—collapsed in their agoraphobia and died.

The towers of the long ear stood on a hill and reached up into the sky. Glassy insulators clung to spider-web-thin struts. The structure appeared delicate, swaying

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in the wind. More than half the crew was unable even to approach the towers. Many of the men who made the climb only lasted a few hours before dropping to the ground in heaps of fractures. Replacements arrived. Spools were creaking at the base of the towers as wires were strung up and down the antennae. Stretcher teams jogged back and forth with their splinted burdens. Fresh details were sent out at dusk to spell the survivors. They worked through the night, swaying against a star-strewn sky. Darkness erased most of the landmarks so the Nebish, limited by his helmet light, worked more comfortably.

Several days later Drum realized where the structure got its name—an oblong dish, a rabbit's ear, was slowly taking shape.

CAPTAIN ODE lost six crew members to agoraphobia. Another dozen or so were in various stages of catatonia.

Rorqual raked well. Her hold already bulged with a hundred thousand tons of food for the Hive.

The alarm siren called Ode's attention to the viewscreen. The deep scanner had picked up a Benthic silhouette and the nets were bringing it in. For a while Ode thought the captive might be canal sirenian or pinniped, but as it was brought closer he saw that it was humanoid, naked and primitive. The crane extruded a soft polymer net and gently dragged the body up on the deck. The crew shuddered at the size of the brine-soaked hulk: six feet long—two feet taller and a hundred pounds heavier than a Nebish. It wore a rope belt, had leathery burnt-sienna skin and large five-toed feet. The crew scattered, wet boots squeaking.

The Sharps Committee met and issued Captain Ode a curved blade. He walked up to the Benthic and nudged it with his boot. It was cold, stiff—lifeless. As a precaution Ode cut the left carotid artery. The blood was purple and jellylike. Eight Nebishes carried the Benthic down to the freezer. Ode reported it as a fossil hominid, theorizing that it had thawed out of some glacier and drifted down in a bottom arctic current.

The CO bounced Ode's report back to Drum with more data. The five-toeds were classified as extinct—fossils—but the Benthic was no fossil. Jellylike blood was quite recent and the inner lining of the cut artery was still white—the intima was not yet stained. Drum called Captain Ode over the long ear.

"So you finally got the communicator working." Ode grinned.

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"What's new in the shipyards."

"Nothing going on at all here," said Drum. "But we are a little worried about you—and that Benthic beast you pulled in yesterday."

"An interesting fossil." Ode shrugged. "But you should see our harvest—"

"That's no fossil," warned Drum. "Maybe the meteors brought back the five-toed hominids, too—or maybe they've been out there all along. Anyway—they are dangerous."

"Nonsense." Ode laughed. "Why everyone knows—"

Sirens announcing the approach of another Benthic beast interrupted him. *Rorqual*'s course held steady until the beast climbed aboard—then the contact with the bare feet sent shudders through the whole ship.

"Sharps Committee—" Ode shouted.

Panic broke out on deck. Boots squeaked and slipped. The crew scattered. Two men fell overboard. Others fled into the trees and below decks. Only two from the Sharps Committee made it to the captain's office. They fumbled their keys into the weapons' locker, but two of the keyholes were still empty. The door wouldn't budge.

"Defend the ship," shouted the captain. "Use any weapon you can find."

The siren continued to rise and fall—bewailing the ship's fate. Even knives and forks were locked up. The reluctant squads that climbed back out onto the deck were carrying such useless things as spools, drinking jugs and chairs—nonweapons. The brine-soaked, naked beast towered over them, puzzled. Someone threw a four-inch bolt at him. It missed, but it clarified the situation in his mind. He lunged into the little Nebishes, kicking and flailing. Soon the decks were splattered with rose-water blood and five-toed footprints. Captain Ode was still tugging on the door to the weapons' locker when the Benthic dismembered him.

Drum cursed his helplessness as he monitored the one-sided battle. The Benthic was not even wounded, yet he had slain the entire ship's complement. He tracked red below decks until he found the frozen body of the other Benthic. This seemed to satisfy him. He weighted it with tools and jumped into the ship's wake with it.

A FURIOUS Drum stomped in on the Hive committee meeting.

"Why does *Rorqual* have to re-

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main neutral? We lost the whole crew to a creature the ship could have dispatched with one swat of the crane."

The Security representative, a fat compromising neuter, turned piggish eyes to him and spoke slowly, didactically. "Your ship is equipped with the WIC/RAC genius circuit. I understand this enables it to survive in very hostile environments. However, we learned a long time ago that our genius machines must never be given the option of killing a hominid of any kind. It might discover a good reason to kill all of us."

Other committee members nodded. Even the CO, one mentioned, used a citizen to push the button that actually executed capital offenders.

Drum sat down, mumbling, "Then why send a crew at all? The ship harvests pretty well alone."

"The *Rorqual Maru* must be manned at all times," ordered CO. "She takes long voyages and gets lonely. To permit her to sail alone is to invite a commandeering by the Benthics."

The teck from Synthe stood up.

"The plankton clouds are widespread. I'm sure we can plot a course that avoids areas controlled by the Benthics."

"And," said Wandee from Bio, "we are working on the genes of a new prototype citizen who will be able to fight the Benthics. A stronger, bigger citizen—who will also fill the job requirements at the shipyards."

"Big enough to handle a Benthic with his bare hands?" asked Security.

Wandee nodded.

"Why—his body would be classified as a weapon. How would you insure his loyalty?"

"Just as certain ants insure the loyalty of their warriors. We'll design him so he can't feed himself."

Drum was shocked. "Do you mean—no esophagus or no hands? Something like that?"

Wandee smiled. "Oh, nothing so crude. He won't even notice anything amiss. We'll delete one of his key metabolic pathways so he'll be dependent on a special diet only the Hive can give him. Without it he'll sicken and die."

Drum shuddered. He was sorry he had asked. A tied-off esophagus could be corrected by a friendly Tinker. What could the poor warrior do about a defective enzyme system if he wanted to quit his job? Nothing.

"Here is a copy of the traits we hope to program into the genes of our warrior," said Wandee and handed him a clipboard.

Drum glanced at the list.

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"Sounds good, but will it walk?" he asked.

"Walk, run, swim—and fight," said Wandee.

Drum was skeptical.

"How can you be sure? Just last year spinner couldn't construct a gene map for marine protozoa. Now you think you can spin us a superman?"

The clipboard was passed around the table. The battle gear it listed was impressive: heavy bone and muscle, a fast reflex time, high pain threshold, potent neurohumoral axis . . . None of the committee members really understood the details of gene spinning. Wandee wanted to quiet Drum's objections without exposing the other complacent Nebishes at the table to a lot of disturbing new terms they might not understand. Drum had an exceptional grasp of matters beyond his specialty and more—he had an open mind.

"Growing the prototype warrior is entirely different. We do not have to build an entirely unknown gene—as we were trying to do with marine biota. Human genes have been mapped many times and about twenty percent of the map is pretty well understood. Enough for us to design certain broad traits we are interested in. We will use the known map of the most primitive human we have on file—Larry Dever—from before the Era of Karl. We still have some of his alpha renal nuclei in suspension. By using his chromosomes—and deleting what we don't want—we have relatively few genes actually to assemble."

"Assemble a Larry Dever?" asked Drum.

"Modified. We'll grow an augmented Alpha Renal Nucleus of Larry Dever—an ARNOLD—with the traits listed."

The chairman had dozed off. He awoke with a start.

"You two can continue this discussion down in the spinner labs. Meeting adjourned."

DRUM marveled at Wandee's deft manipulations. The meiotic renal cell was spilled into the sorting chamber filling the screen with X- and V-shaped chromosomes. She selected those to be augmented: a large D acrocentric #13; two B submetacentrics #4 and #5 and an F metacentric #19. They were moved into the cutting chamber. Her electron pencil carved as she talked.

"We'll cut off half of these long arms at the secondary constriction—a good landmark. Remove those little satellites—and take off the short arms from this late replicator. Careful of that

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centromere. There, now—plenty of room for translocating the synthetic chromatids from the spinner's bath."

The bath (a soup of purines and pyrimidines) contained the enzyme *reverse transcriptase*—the RNA-dependent DNA polymerase. (RNA molecules act as templates for the replication of DNA genes.) Spinner assembled the RNA template: GCAUGGAUCUU—guanine, cytosine, adenine, uracil, guanine, etc. When added to the soup a DNA gene replicated: CGTAC-CTAGAA—cytosine, guanine, thymine, adenine, cytosine, etc. Each grouping of three bases formed one codon (or letter) in the genetic message.

"This appears to be an excessive amount of the Grube-Hill gene," suggested Drum. He had been studying spinner's screen where the molecular activity was being simulated.

"A triple dose of gristle." Wandee smiled. "Our ARNOLDS will be real mechanized-armor bucks with triple calcium, collagen, phosphatase and growth hormone."

Drum nodded, frowned. "But what is this sequence? It does not translate."

"The Hive safety factor—a nonsense sequence where the gene locus for amino-acid synthesis should be. The bases have been scrambled to UAA, UAG and UGA, which do not translate at all. The ARNOLDS will be unable to synthesize six of the amino acids you and I can manufacture from the inorganic constituents in our diet. For ARNOLD, alanine, aspartate, glutamate, glycine, serine and tyrosine will be essential—along with the other nine all of us need in our diet. ARNOLD's diet must contain these fifteen essential amino acids or he'll become protein-deficient, weaken and die."

Drum was silent. He felt uneasy about building the ARNOLD—a human who would lay down his life for the Hive, not realizing that the Hive had implanted in him this molecular time bomb that would kill him if he became separated from the Hive. Drum felt himself to be more of an enemy to ARNOLD than the Benthic beast.

A codon GAG was changed to CAC, substituting the histidine letter for a glutamine—another nonsense sequence closing the transaminase "back door" to one of the amino acids. ARNOLD would not be able to get his amino acids even from his Kreb's cycle.

Playing with the Watson-Crick structures was tedious work, but soon Wandee had several clones working on the prototype ARNOLD DNA.

"We can sort the cells out of

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culture on the basis of their Grube-Hill content. Those with a lot of phosphatase fluoresce the brightest with this labeled substrate. We'll embryonate about a thousand of the triple GH's first."

Wandee hovered over the foaming nutrients and plated the placental matrix with the first hundred cells that showed chorionic tendencies (villi and gonadotropins). Soon the embryos were visible under the magnifier.

Wandee seemed pleased.

"Size and length of tail are good indexes at this stage," she said. "But I like to rely almost entirely on the Organ of Zuckerkandl—the chromaffin tissue near the inferior mesenteric artery. It is a good index of the neurohumoral axis. Autonomic tone, sex organs and adrenal medulla function can usually be predicted by studying the O. of Z."

Drum nodded. "And how many toes?"

"Oh, they'll all be five-toed, of course."

TWENTY thick-necked, hairy infants survived Wandee's critical culling. They were tested repeatedly and the six most vigorous were turned over to Mullah. The rest went to shipyard nurseries on high job priority.

Warrior human beings
Under Hive's control—
Spinner made your genes.
Who made your soul?

IV

TANGLED girders and crusted plates were the tapestries for Listener's eulogy on the funeral raft. Benthics crowded around the weighted body. They were gathered in the far bubble of a torn tubeway overlooking the yawning blackness of the abyss. The body drifted for a long moment. Then it began to sink slowly, accompanied by a halo of zooplankton fighting over its nitrogen treasures.

"The Leviathan is not a whale?" asked Listener.

"A ship," said Clam. "I was all over her insides. I saw no sign of an organ or a muscle of any kind—just rooms and machines."

"But this machine—it showed signs of life after you had driven the crew away?"

"Yes. I heard and felt things I didn't understand. But I'm certain it knew I was there. It opened doors for me and followed me with little eyes in the walls."

"And it didn't try to harm you." Listener smiled. "Wonderful. I'll bet the Leviathan is a friendly ship."

"But it killed Peter," objected

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Clam. "The nets caught him at fifteen fathoms and pulled him up until the pops got him."

"Perhaps that was an accident," suggested Listener. "A surface machine like the Leviathan may not know about the pops. That is one of the secrets of the Deep Cult. I think we should try to capture the Leviathan. Perhaps we can learn to talk to it."

Opal said, "It might be able to protect us from the Hive."

The Benthics passed the word along the reef. The ocean would be theirs.

YOUNG ARNOLD buckled on his harness while the workmen loaded his two-wheeled cart. He munched on the crust of 15-amino-acid bread. All his food was handed to him by his supervisor. He leaned into the straps. Wheels creaked. It was a two-hour run to the top of the spiral.

Citizens were already lined up at the dispenser when he arrived. The pressure had fallen again and they would have had to go down to shaft base for their calorie basic if it weren't for ARNOLD's training runs.

"Good time, ARNOLD," said the workman who had ridden in the cart. He climbed down and handed ARNOLD a yellow-4 sweet.

ARNOLD squatted in his harness, chewing his treat. He was only six years old, but was already the size of an average citizen. His powerful calf muscles tingled after the workout. Soon he would be trained to work in the shipyards, they had told him. The work was important—clearing rusted debris. He was a very bright ARNOLD. He understood everything real fast. His mentors hardly ever had to use the whip any more.

That night he slept under his cart at the loading docks. He had lots of room to stretch out. The workers on the shift made hardly any noise at all. His chains were real long—a light new alloy. He was fed his special 15-AA bread six times a day. He had lots to eat and grew fast.

DRUM sat on the edge of the wagon and offered ARNOLD an orange-3 sweet bar.

"All of us are Reincarnationists," said Drum, speaking slowly. "We believe in the transmigration of the soul. Our souls lived in other bodies, even other creatures, before inhabiting our present ones. We go to the chapel and try to feel some experience from a previous life. We learn to understand ourselves better—become better citizens. Would you like to do that, ARNOLD?"

ARNOLD nodded.

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"You may find that you weren't always a draft animal," said Drum.

ARNOLD grinned. He did not understand what Drum meant.

An appointment was made with Mullah.

ARNOLD appeared at the chapel with Drum at his elbow. He was almost two feet taller than the average citizen as he walked down the aisle, his chains going *ching, ching, ching*. The walls of the chapel were covered with the Darwinian Transmigration from amoeba through invertebrates, lower vertebrates and finally the highest animal—the four-toed Nebish. The robed Mullah directed ARNOLD to put down his chains and stretch out on the heavily telemetered couch. The links clattered noisily to the floor. Four meditecks tubed and wired him to the sensory tape machine for a review of his phylogenetic tradition—his leptosoul.

"Let's see if we can establish a common language between the tapes and ARNOLD," said Mullah. They watched the encephalogram as a combination of drugs and midbrain trickle current suppressed ARNOLD's consciousness.

"It will take several sessions before leptosoul imagery is clear. The symbols we will start with are basic: itch, thirst, hunger, sleep, sex—things like that. The itch is useful in localizing a sensory message. It is better than pain or heat or cold, because the itch stimulates you to do something other than simple withdrawal. The itch gets you to scratch. Notice the readouts. He is getting a good response to both central and peripheral itching."

Drum watched the ARNOLD get exposed to thirst, probably one of the oldest phylogenetic memories dating back to the time life left the seas. Hypertonic fluids bathed key receptors, making him physiologically thirsty. Neurological thirst came with steriotactic sonic stimulation of the thirst center in the brain stem. Psychological thirst was induced by images of dust, dry leaves, skeletons and a distant lake mirage. Heat and a throat itch brought physical thirst. ARNOLD writhed and suffered 4-D thirst. The thirst stimuli were turned off and cool, hypotonic fluids were flushed into his stomach.

"Hunger can be a bit dangerous," warned Mullah. "When we sag his blood glucose under forty milligrams we run the risk of causing brain damage. We lost several citizens early this month during this step. The tubes empty his stomach and pucker the rugal

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folds with cold water. Insulin drops the blood sugar. The hunger center in the brain stem is stimulated and the itch is located in the mouth."

ARNOLD experienced visions of skeletons familiar to him from the thirst sequence, only this time he wanted to stuff his mouth with meat pies and sponge cakes. The stimuli were stopped and relief came in a visual image of the hand of the Hive carrying pies and cakes.

Mullah looked up.

"Sex is an important warrior drive. We can use it for imprinting and motivating other lesser drives. A mature male is the best engineered warrior in terms of muscle and bone. Testosterone, you know. For this imagery we localize the itch in the genital region and the neural stimulus in the basal ganglia. We can program a variety of sexual encounters for imprinting. The last symbol is sleep. The itch is a bright red asterisk behind the eyelids. Neural stimuli play with his alpha rhythms."

"That seemed to be a good session," commented Drum.

Mullah nodded.

"Since he is to be a warrior, we might as well offer him a little vivid imagery to take home with him."

Stag ARNOLD perched on a low fir limb, reigning over beautiful speckled Frost Gray hens. They scratched and pecked in musty humus. He smelled aromatic pine needles and saw glistening grubs. The power of his spur stubs made him cock of the knoll. The day before he had knocked a great yellow cat from this very limb. The sex urge pulled him from his perch. He swooped down on a pretty little hen and grabbed her by the short feathers. She squawked and struggled, but he pinned her to the ground, mated and strutted off with a cavalier air. Flustered, she preened her disarray. Crowing, he returned to his perch . . .

The leptosoul experience left young ARNOLD puzzled. Residual euphoria made him want to crow. As he gathered up his chains he stared at the links for a long time. They seemed out of place now that he had relived part of a regal background. He, ARNOLD, had been a king—a feathered warrior—a game fowl.

Drum watched the giant leave. He shook his head slowly, saying, "Poor ARNOLD. The Hive has a big job for you."

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"I think he is equipped for it," said Mullah.

Drum eased himself down on the edge of the couch. Raising ARNOLD had drained him. One lens had clouded over and all his teeth were gone. He had little time left.

"ARNOLD has a big job," continued Drum, "and he can never retire."

"Why?"

"The safety factor. We programed his genes so he can't make fifteen amino acids. He can never live on calorie basic. In fact, he can live on nothing in the Hive except his own special fifteen-AA crusts. If he lacks just one of those amino acids his protein synthesis stops. He sickens and dies rather horribly—swollen with edema fluids, bleeding, ulcerating, paralyzed."

Mullah said, "But if he works he will eat. Everyone does his share—some do more. Look at yourself, Drum. Once you stepped outside your caste the Hive had you doing everything and anything to keep your Recertification job vote. You're the oldest out-of-caste laborer I've ever seen. ARNOLD won't have it any tougher than that."

"Unless he becomes obsolete. He's very specialized, as you well know."

BIG OPAL cautioned her adventurous daughter White Belly to stay away from South Abyss.

"Leviathan has been sighted there. Leave her to the males. Clam is taking his mussel scrapers there today. You work North Reef."

White Belly nodded reluctantly and swam north. She had been a surface baby—born in Halfway House. She had spent much of her youth swimming around buoys and soaking up solar UV. Melanocytes darkened. Her freckled, brown back and pale abdomen had given her her name.

Born too late for raiding the Gardens—the Hive was once again active Outside—she was now being denied the excitement of hunting the Leviathan.

DRUM studied the ocean charts. The years of raking had given the Hive a good picture of plankton distribution along the shelf where upcurrents carried nutrients from the ocean floor. Benthic beasts were also located on the shelf—in the flooded ruins of old Rec Centers around the twenty-fathom range.

ARNOLD was ten years old now. His years in the shipyards had hardened his body. His visits to the chapel had strengthened his leptosoul.

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Capon ARNOLD roosted with other fat-bottomed neuter birds—neither cock nor hen. Each had his own mush cup and water. ARNOLD was restless. His soul remembered when food had flavors and hens were speckled. He tried to stir up his roostmates by pushing them away from their mush and eating it himself. They wouldn't fight. They just lowered their heads. He gained weight rapidly and invited an early axe.

END OF TAPE. NEW LEPTOSOUL: BATTLECOCK.

Battlecock ARNOLD was all testicular valor and iron spur. His days of secret training in the keep had hardened his body and strengthened his wind. A hundred times a day he had been tossed by the *hand*. Each time he flew back to his windowsill to look out into the hen yard. His diet removed extra water and fat from his body: Twelve kernels of corn, chopped cooked meat, chopped lettuce, wheat germ, honey and peanut butter. When his irons were tied over his spurs he knew someone would die. Odors of blood, tobacco and whiskey told him that other *hands* were there with their cocks. He rested comfortably in his handler's arms until the time came to fight. He was placed in the pit with a Claret. Twice they went up and locked irons. Each time they were tenderly disengaged and placed back in the pit. ARNOLD was blind now. He had taken some iron in the skull. He couldn't see the Claret, so he waited. When the Claret attacked he knew just where it was.

ARNOLD went up, striking out with his spurs. He felt the Claret's iron in his belly and left wing. Then his own iron crunched cartilage and diced myocardium. When they were disengaged this time he was held in the arm and petted by the *hand*. He heard the Claret's last coughs.

When ARNOLD's orbital hematoma subsided the hens were his. He was brood cock now—under wire—with three of the most feminine Frost Gray hens. The big hen tried to shoulder him away from the water, but he gave her a resounding peck. He

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was king. Soon all three would be setting handsome clutches of eggs.

One morning the wind brought a faint answer to his crowing. There was another cock on the other side of the ridge. He couldn't wait for the chicken wire to be lifted.

"This wire is the only thing that keeps you alive," mumbled ARNOLD.

"Wonderful," commented Mullah. "Notice how real these lepto-soul experiences have become for him. He is 'ARNOLD the battle-cock' in his subconscious. These 4-D sensory dreams have more significance than his dull routine of real life."

Drum studied the feedbacks to see if ARNOLD was showing maximum effects. There was still room for improvement.

"Let's step it up next time. We'll run through these tapes with more energy—enhance the axe pain in the Capon sequence, build up his euphoria and sexual stimuli after the battlecock win."

"When does he sail?" asked Mullah.

"Soon. Perhaps on his eleventh birthday. His testosterone levels are high enough. Epiphyses are closing. He'll be ready."

"Yes. I'm sure he'll do fine."

A SULLEN CLAM stalked on South Reef. Warm body tickling sensors—his presence activated ancient circuits, and fields of waving, man-sized umbrellas welcomed him. He swam toward Leviathan's trawling lane pausing at two-fathom umbrellas to fill his lungs. Ahead of him the reef sprang to life. Meck pumps filled the umbrella air pockets. Snap electrolysis spiked the air with oxygen. Clouds of marine scum and overflow bubbles rose from the writhing shapes—cyber barnacles that had survived the twenty-seven centuries to serve the rare fugitive Benthic.

Clam waited at the edge of the reef. Behind him the umbrellas quieted. He watched the surface overhead. A dark sky spat big drops into the choppy water. Leviathan's whale-shape approached trailing nets. Clam left his air pocket and grabbed the fine mesh netting. In a moment he was on the rain-spattered deck. His boarding caused pandemonium this time. The siren initiated a regular cadence of squeaking boots. Rows of Nebish crew members lined up, carrying shoulder-high netting—walking fences. Clam leaped onto the cabin roof.

Thunder rolled. Hump palms rustled in the wind. ARNOLD stepped out of the foliage and

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studied the Benthic—a hundred yards away. Both were six-foot giants; half again as high as the other crew Nebishes. Clam was dark-skinned, naked. ARNOLD wore standard coveralls with a wide, studded belt, but his big bare feet made flat sounds like Clam's.

"Hello," shouted Clam, waving.

ARNOLD silently motioned for the net fences to be lowered and advanced slowly across the rows of wet mesh. Clam glanced around for a possible attack from behind. The nose of the ship had no hatch. Beyond the hump the crane worked casually on heavy plankton netting. Only the deck crew and ARNOLD seemed to notice him.

"I can let you live," offered Clam," if you give me this ship."

A cock crowed in ARNOLD's subconscious.

Clam couldn't believe the fury of the attack. The ARNOLD had sprinted across sixty yards of open deck and leaped on him—kicking, biting and elbowing. They tumbled down onto the deck. ARNOLD's teeth were crunching deep into Clam's left forearm. A wave carried the fighters off the nose of the ship and the huge maw sucked them into the rakes. ARNOLD's fingers closed on Clam's throat. The Nebish netters draped the pair with sticky tanglefoot mesh. Clam clawed at ARNOLD's fingers as his sensorium clouded. The tunnel vision frightened him. He found ARNOLD's left middle finger and quickly bent it back— breaking it with a *snap*. He clung to the stump twisting it hard. ARNOLD's grip slipped. Clam vaulted back into the sea, dragging the netting and three drowning Nebishes.

DRUM wheezed and patted ARNOLD on the forearm. A banjo-splint held the damaged finger along with all four fingers in a fanlike position.

"Good warrior. You did well. You are only eleven years old and you defeated the Benthic beast, saving the ship. The sea is open to the Hive."

ARNOLD smiled and nodded. He accepted the accolades and returned to the shipyards. When his injuries healed he'd captain again.

Drum took the battle report down to the chapel.

"We'll have to step up his battle conditioning, use those heavy tapes — Dan-with-the-golden tooth."

Mullah programed his leptosoul meck.

"How far do you want to go with this? I've got one where Dan allows his head to be cut off so he can

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fight two battles at the same time. His head wins and then flops into the second pit where his body is holding the second contestant. He wins both fights, naturally."

Drum shook his head.

"No, keep the battle physiology plausible in human terms. We want ARNOLD to use a little judgment. In name at least—and by the grace of some learning-tape conditioning—he'll be captain of the ship. He's programed for a little judgment—not much.

Dan worked the cold femur back in his mouth. Molars cracked it open and the rusty marrow and crumbling bone distended his gastric rugal folds, loading his hepatic lymph with iron and calcium ions. Dan sniffed the dirt, wondering where the other old bone was buried. *Cluck. Cluck.* His wards, the feathered friends in the coop were upset.

Ears up, he watched the scrub pine. A massive intruder appeared—black and hairy—walking on its hind paws. The intruder had long claws and sharp white teeth. It was twenty times his size. Dan froze to quiet his chain. The intruder was intent on the succulent coop dwellers. It failed to notice the circle of dead grass that marked chain's end. As its big left hind paw entered the circle Dan leaped and sank his teeth into the black shaggy hide. Tendons jumped under his fangs. A hot tibia split. The intruder was down—howling. Claws and teeth ripped Dan's hide open, snapping his spine and spilling his intestines. Dan tightened his jaw as darkness swallowed him up.

Dan's leptosoul floated above the gory scene. The bulky intruder limped off with a distinctive lump on its left ankle—Dan's head. The baying of a pack of hounds and a rifle sound finished Dan's job on the intruder.

ARNOLD snorted, strode out of the chapel. Drum was impressed. He stayed behind to study the tapes.

"What was this creature— this Dan-with-the-golden-tooth?"

Mullah smiled eagerly, "These are the most aggressive leptosoul tapes we have. I think the subject was a small meat-eating pet that worked for man—protecting him against varmints big and small. He was so aggressive he had to be muzzled to be bred."

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"Why? Couldn't he recognize a female?"

"Yes, but apparently he fought anything that came into his territory. Fought for wagers, too. But the beast obviously could not tell a bet from a stud fee, so he had to subdue any female he met to be safe."

"It certainly worked. Look at ARNOLD's adrenergics."

Mullah frowned, "I hope this doesn't endanger his Hive loyalty. Adrenergics like that in a citizen would make him a candidate for the psych clinic."

Drum wheezed and sat down. His jaw ached.

"We needn't worry about Arnold's loyalty. He can't live without the Hive's fifteen-AA bread."

Mullah nodded, reminded of the safety factor in Arnold's genes. Then he noticed Drum's discomfort.

"Life span coming to an end? Want me to call VS?"

Drum shook his head. He would live out his span warm.

V

OPAL changed Clam's bandage. The toothmarks in his forearm had gone purulent, were draining cloudy pink fluids. The arm was swollen to twice its size and the fingers would not move. Fever racked his body.

"He still smells foul," complained sister White Belly.

"If that arm doesn't improve by tonight I'll have to amputate," said Opal.

"He needs hot packs and hot broth," said White Belly.

"We can't go to the beach and build a fire. The Hive would find us."

Young White Belly brooded and swam alone. She found herself at Halfway, where she had been born. She told Listener about Clam's injury.

"We must get him down into the squeeze where the air is thicker. His infection sounds anaerobic. *Clostridia* type of gangrene. Oxygen will cure it down in the squeeze. Come with me."

They dragged the delirious Clam from bubble to bubble as they descended into the abyss.

"Don't come any farther. If you aren't used to it, the thick air will give you the fits or the giggles. I'll take Clam to that dome down there to the left. He'll have air and fresh water. If he isn't better in twelve hours there is nothing more we can do," explained Listener.

He towed a limp Clam down another ten fathoms and they disappeared into a pale glowing dome. White Belly waited in a cliffside

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umbrella. The oxygen made her feel a little giddy, but she controlled her silly impulses as she stood watch over her brother's dome. A strange humanoid creature visited the dome. It had wide lacy wings like a butterfly—one of the Deep Cult that lived off the Benthics' offerings. Opal came down and tugged White Belly back to the upper level.

"We must stay home for one day after visiting the squeeze or the pops will get us," said Opal. "Then you must do Clam's chores. He was harvesting the South Reef. But, beware of Leviathan."

White Belly toyed with the fragments of polymer netting that Clam had brought back.

"What was that big thing on Leviathan? Another Benthic like us?" she asked.

Opal shook her head.

"No, child, Listener says it is an ARNOLD. The Hive can build people as easily as you or I can draw their pictures. They wanted a big one to fight us—so they grew a big ARNOLD in a bottle. Without a mother. Just a bottle."

White Belly sharpened her abalone iron.

ARNOLD sat by Drum's sickbed as the teck removed the banjo-splint.

"See, Drum," ARNOLD said, flexing. "I'm fine."

Drum grinned weakly, "Good boy. Now go back to *Rorqual* with those extra cyber panels I gave you. Wire the ship to talk to you. Tell it to warn you if the Benthic beasts appear. Make friends with the ship. It is a good harvester. Take care of it and it will take care of you."

ARNOLD patted the old man's shoulder. As he left he paused in the anteroom. A battery of Hive personnel huddled around a temporary communications center. Wandee sat among a group of tecks, reading Drum's bio-electricals.

ARNOLD towered over the group with a pained expression.

"He's stable by the charts," said Wandee. "The CO wants you to know that the Hive is doing everything it can for him."

ARNOLD nodded. He picked up the cyber panels and carried them to the docks where *Rorqual* prepared for her next voyage.

Once on board, ARNOLD set to work at splicing the new panels in place. Learning tapes had prepared him. He crawled between walls, moving the thick, fluffy insulation around to make room for the new units. When he was finished he patted the wall.

"There you are, old girl. You

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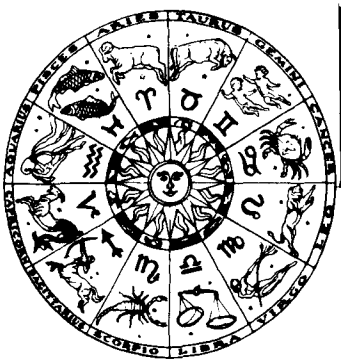

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should be able to work your lingual readout now. What do you say?"

"Hello, bare feet."

ARNOLD glanced down, smiling. He was the only crew member without boots.

"Wonderful, you sound fine. What else?"

"Clear my hump."

"Clear it?"

"Yes," said *Rorqual,* "the electrolyte spray burns."

"The sea mist—does it really hurt?"

"It burns," said the ship. "Clear my hump and close my plates. The wind-blown electrolyte burns and ages me."

"Right away, old girl. You machine a nice double-bladed axe for me and I'll get right to work on your hump trees."

ALTHOUGH the *Rorqual* was far out to sea, the axe looked like a weapon to Hive Security. The committee was called into session. They opened channels to *Rorqual* and the CO.

"Why wasn't the Sharps Committee informed prior to the blade's manufacture?" asked Security.

"It is a tool," said *Rorqual.*

"Does the ARNOLD intend to put it in the arms locker immediately?" asked the chairman.

The screen focused on a deck optic. A storm had blown up and a dark, heavy rain splattered into the hump vegetation. ARNOLD sang as he chopped. Wood chips were flying. The question was repeated. The wind carried away the words.

"What?" asked ARNOLD.

"Do you intend—" began the chairman. His words were choked off by his view of another figure moving behind ARNOLD—a wet, naked Benthic.

A siren.

ARNOLD turned, axe in hand, to meet the lunge of White Belly—breasts, hips and a voluminous mane. Axe and abaalone iron *clicked* and *clacked.* Her iron sliced across his chest, cutting fabric and chipping thick studs. Her left hand was on the axe handle above his. She stabbed and sliced with the iron—opening his coveralls. He caught her mane in his left hand and they rolled on the wet deck. Lightning flashed. Wood chips and wet leaves clung to her warm, moist body, giving it a speckled appearance.

(Something went *cluck, cluck.*)

Her blade sank into his side, releasing a well of thick dark blood.

THE screen before Drum's deathbed focused on the struggling pair.

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"He's wounded." Drum watched the main project of his lifetime hang in the balance.

"Just a knife in the *latissimus dorsi,*" reassured CO after a study of the bio-electricals. "He's fine, but needs encouraging words. Tell him to chop off her head."

Drum moaned in his orthopnea. The deck scene was obscured by the misty rain, but ARNOLD seemed vigorous enough.

"He seems to be doing fine," wheezed Drum.

"But he's not killing her," objected the CO. "I can't get involved, being a meck—but you understand our mission here. Tell him to fight."

Drum could not understand why the CO was dissatisfied with ARNOLD's performance. It was clear that he had the Benthic subdued. He had it down on the deck. A good grip on its mane—oh, yes! He wasn't fighting. He was copulating. The Benthic was a female.

Drum chuckled, wheezed and coughed.

"Humor?" asked CO.

"It's those Dan-with-the-golden-tooth leptosoul tapes. Dan never could tell a bet from a stud fee."

ARNOLD stepped away from a prone White Belly and pulled her weapon from his *latissimus* with a cavalier air, tossed it aside. She scrambled into a crouched position—eyes blazing. Her speckled skin excited him. He took a step toward her.

"Touch me again and I'll kill you," she growled.

He paused, thinking. Odd, but the threat meant absolutely nothing to him. He continued to advance. She glanced around for her iron. It was too far away. Turning, she dove into the sea.

"WHY?" asked CO.

"Copulins," said *Rorqual.* "She was reeking of male sex attractant—the primate sexual pheromones. I ran a few whiffs of her body odor through my chromatographs and came up with the simple aliphatic acids: acetic, propionic, isobutyric, butyric, isovaleric and isocaproic—the constituents of copulins. ARNOLD has an intact rhinencephalic-hypothalamic pathway. He couldn't control himself."

The committee reviewed the behavior of their marine gladiator.

"Nose plugs. All he needs is nose plugs and he will do just fine."

But ARNOLD did not do just fine. He stood on the deck a long time before returning to the work on the hump trees. The work went slowly, but smoothly. With

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one eye on the seas he chopped and directed the removal of twisted plates with their medusa-heads of roots. New plates were brought in by the crane. *Rorqual's* skin was slowly healed. The ship was grateful.

DRUM was aroused from an agonal stupor by the Mullah and Wandee.

ARNOLD had defected, they told him.

Drum blinked. He could not grin, though he wanted to. A line of saliva trailed down his chin.

"He turned off *Rorqual's* communicator. We guess that he is searching for the Benthics. Psychteck reviewed the optic records and thinks he is sexually imprinted on her. Something about being imprinted on speckled hens at the chapel. The Benthic was speckled with freckles."

Drum moved slightly, whispering, "Why pick on me?"

"You're his father figure," said Mullah. "Wandee spun his genes, but you took him to chapel and spent a lot of time with him. He'll listen to you."

Drum shook his head. "If he wants to be free—"

"But he will just die," moaned Wandee. "He must return for his Hive fifteen-AA bread."

"You told him?"

"Yes, but he doesn't believe us. He might believe you."

Drum was propped up with pillows.

"Just talk slowly," said Wandee. "The CO will record it and broadcast it every few minutes. *Rorqual* isn't sending—but it may have its long ear on, listening."

"ARNOLD—son—" Drum coughed. "We made your genes. We gave you a powerful body and a good mind. The best in the Hive. I know you want to be free, but you can't be. The Hive asked us to design your metabolism so you'd be dependent on the special fifteen-AA bread. Without it you'll sicken and die. Believe me—son."

Rorqual opened a channel to Drum. ARNOLD was not in view. The ship spoke.

"ARNOLD doubts your words, Drum. Perhaps I can relay your message in terms he can understand, but I, too, find it difficult to understand why he needs a special bread. All humans have some essential amino acids.

Wandee interrupted, "Here is the list. ARNOLD has six more essential amino acids than other humans. He must return."

Rorqual studied the list: alanine, aspartate, glutamate, glycine, serine and tyrosine.

"I understand," said the ship.

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"Now I shall try to explain it to ARNOLD. Somehow I shall make him comprehend."

The screen darkened. Drum's tired face went cyanotic at the same time. Bio-electricals flattened. His mind struggled against the enclosing void. He had had one more question to ask, but he was unable to get it past his cool lips. He had wanted to ask—how many amino acids were in plankton?

THE Hive never saw *Rorqual Maru* or her ARNOLD again. Benthic sightings became almost nonexistent. Muscular and lesser ARNOLDS waited in shipyards with their heavy tools, but Hive allocations for raking were held up in the committee. Their experience with ARNOLD had left too many questions unanswered. The added marine calories had not been worth all the expense. ★

★★★ GALAXY STARS ★★★

Asked to supply autobiographical material for GALAXY STARS, the always obliging Michael Coney was good enough to send us a revealing sketch. We pass it on to you, verbatim:

On a dull day at age 17 I was working in the office of an accountant. I was a bored clerk. Next to me was an engrossed clerk. Desirous of knowing his secret, I looked over his shoulder. Concealed among the pile of books he was supposedly auditing was an open magazine. Peering curiously, I read the words that were to change my life: "The creature reared up on its six hind legs and gazed across the sea of methane." I have never forgotten those words; they shone like a guiding beacon in the maelstrom of debits and credits; I borrowed the magazine and was hooked.

Later reading followed the usual course for an English fan: Wyndham, Bradbury, Heinlein, Aldiss, *New Worlds* mag and, naturally, Ballard. It was while critically completing a questionnaire in *New Worlds* that the idea occurred: if you can't beat them . . . The inevitable 200-word vignette was greeted by editor Michael Moorcock in kindly fashion but with extreme reservations. I bear him no grudge whatsoever.

That would be about 1966. I suffered badly at the hands of editors until 1968 when an unexpectedly slim envelope arrived to inform me of my first sale. Since then I have sold some twenty shorts, mostly in Britain. (Editor's Note: "Esmeralda," in this issue, is the fifth for GALAXY.)

I am happily married and have sired children, also happily, and I have frequently changed address (no connection with the foregoing) around England, ranging from Birmingham to Devon and including points between. I have worked in accountants' offices, vacation resorts; I have chartered boats and been landlord of a village pub. At present I am managing a hotel and night club in Antigua, West Indies.

Future plans? Another year in the Caribbean—time for a dozen shorts and, with luck, a couple of novels. Then a move to Canada.

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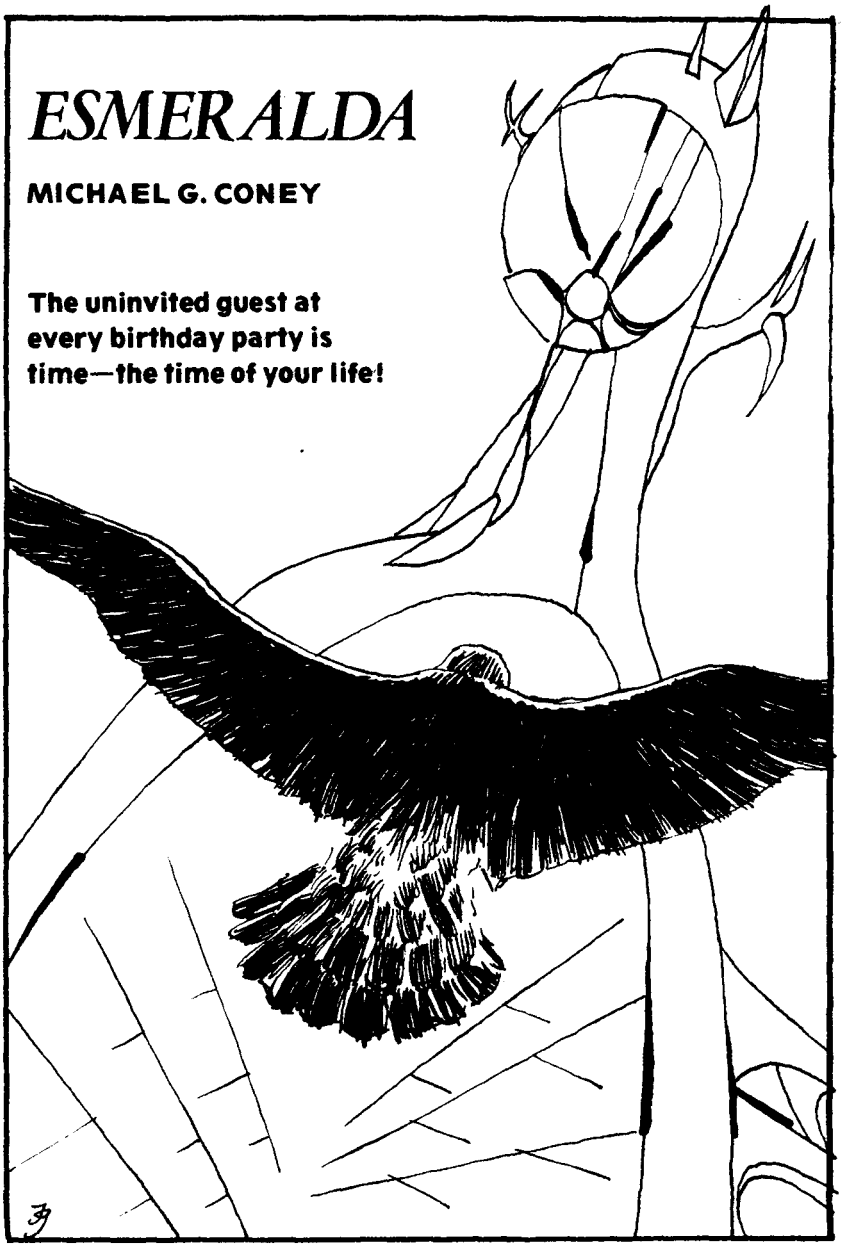
ESMERALDA

MICHAEL G. CONEY

The uninvited guest at every birthday party is time—the time of your life!



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ON THE day following the visit of the mediman Agatha and Becky were still discussing the purpose of his call. The slight edge of alarm in their deliberations was caused by the inexplicable air of mystery which had attended yesterday's interview. Their ancient house sat starkly alone between the fens and the sea. It was a lonely boxlike structure one hundred yards from the beach—twenty miles of flat land separated it from the nearest supercity. The wind blew constantly off the sea, whistling through the eaves as though seeking to erode the dwelling to the level of the surrounding countryside. Agatha and Becky were both over sixty years old and lived alone, their only companionship being each other and the frequent roar of the Brontomech as it labored mindlessly among the inland fields.

And more recently, Esmeralda.

"The mediman didn't like Esmeralda," observed Becky, outraged at the memory.

The gull watched her with a winking yellow eye from her straw in a cardboard box. Her feathers were cleaner now; careful wiping with detergent had removed most of the viscid crude oil.

"He said the gull was a useless bird," agreed Agatha, "and better dead."

"But it made a change to have a visitor. It's been—" Becky pondered. "A year or more, hasn't it, since we had a visitor?"

"You can't count the Flymart." They dialed for the Flymart weekly and it winged across from the town within minutes, settling down on the beach with a roar and a scattering of oily pebbles, shouting its wares in a mechanical voice as the display hatch slid open.

"You forgot the butter," accused Agatha, reminded. "Last time you forgot the butter." She scraped a sparing smear of butter on her toast and took a delicate mouthful. "There's a service charge for the trip. We'll be out of butter before next week and we can't afford the Flymart just for butter."

She subsided, munching, her withered cheeks articulating.

"You wash up," said Becky. "I'll see to the fowl."

She rose and went outside.

The hens were pecking in the yard; as they saw her emerge they ran to her in quick short strides and cackling. They clustered around her ankles as she unlocked the shed door and she wondered, as always, why she and Agatha should bother to lock up their property in a situation so remote. There was little of value in the

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shed—a sack of grain for the fowls and a bench with a few simple tools, the use of many of which Becky had long since forgotten. A small barred window afforded grudging light. A sharp peck on the ankle reminded her that the hens were becoming impatient and she dipped the scoop into the open sack, savored the warm, dusty smell, received another jab and hastily moved back to the door, flinging a spray of grain into the air. The fowl scattered, clucking; soon their beaks were beating a clicking tattoo on the old brick floor of the yard. Becky watched them for a moment, then walked across to the gate, opened it and let herself out to the beach.

It was a damp morning. The sea was flat and sullen and viscous. Lumps of crude oil bobbed at the edge where tired waves, burdened by the weight of pollution, struggled against the pebbles. Becky began to walk slowly along the waterline, examining the black residue of last night's tide. Occasionally she bent and retrieved a stick of driftwood—the oil-soaked timber, when dried, burned well. Little flurries of drizzling rain reminded her that she must hurry or Agatha would become alarmed—at their age, health must be safeguarded.

They were lucky. They were both exceptionally healthy. She had felt proud of her health when the mediman had called. When he had examined her and asked her if it hurt *there* or *here* she had made no complaint.

HE HAD checked them with his records and he had smiled quite pleasantly when he had verified that she and Agatha were in fact twin sisters. Everyone liked twins, especially identical twins. Agatha had asked him: surely he had noticed they were identical? Then he had said a curious thing, rather hurtful. He had said that all old ladies looked the same to him. After that the visit had not gone so well. He left some pills but had forgotten to tell them the dosage. She had protested when he had given her the injection for her very slight arthritis and he had said curtly that he had no time to chase about the countryside calling on people who had left it too late. He had given Agatha a shot, too, to be on the safe side, and had warned them briefly of the dangers of damp clothing and cold winds.

Cold winds. Again there was a flurry of wind and Becky walked a little faster, but still carefully, not wishing to stumble on the greasy pebbles. A dead seagull caught her eye and she thought of when she and Agatha had found

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Esmeralda, struggling and impregnated with oil, last week. This gull was really dead—she prodded it with her foot, rolled it over, and it stared at her from empty sockets. Shivering, she turned inland across the short sparse grass toward the fence that separated their property from state land. Sometimes a hen got out and laid its egg under the twisted, salt-blasted bushes behind the house.

A familiar approaching bellow caused her to look up. The Brontomech was nearing the fence. She leaned against a concrete fencepost to watch. The machine was huge and, despite its frequent appearances, frightening—she watched it with a fascination that amounted almost to hypnotism. It rolled across the flat ground on six tires like gigantic doughnuts, each one at least twelve feet in diameter. Mounted high on the front were the sensors; olfactory sensors sniffed for signs of decay, visual sensors peered this way and that; one glanced at her with a cold eye and she flinched involuntarily. Audio sensors listened, huge circular ears that could identify a pest at fifty yards. As she watched one of the ears twiched and became still and the visual sensors, having identified her as human and thus losing interest, swung in unison and concentrated downward at a point some twenty feet before the machine. A pulse of fierce light probed the soil, frizzling black a small area of the late golden crop. In the crackling of the conflagration, Becky imagined she could hear the last squeal of a small field animal—a mouse or a rabbit.

Meanwhile a drench of liquid manure and weedkiller was spraying from the rear of the machine, mixed with a scattering of mutated seeds. The Brontomech carried out the functions of reaping, fertilizing and seeding in a single operation; scooping high-yield corn into its gigantic maw, pulverizing and returning the short straws to the soil, fertilizing and reseeding the land with a fast-growing winter crop of superkale. Becky's fascinated gaze was always drawn to the huge mouth, toothed and champing as the machine lumbered forward, affording a glimpse of fiercely whirling knives in the cavernous throat. There was a very real, terrifying hypnotism about those irresistibly advancing jaws. She always stayed prudently on her side of the fence when the Brontomech was in the area.

Hypnotism and a mouth before her, speaking unheard words which registered below her level of consciousness . . .

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Agatha?"

Yes, Becky?

Agatha dried the breakfast cutlery with a white towel in skeletal hands.

When the mediman examined you in private—in your room—what did he do?

Oh, he asked me things. I wonder if the gull likes bacon.

Agatha began to chop the rind with a bright, sharp knife. Deft strokes—and Becky shuddered suddenly and without reason as the blade flashed in the light.

What sort of things?

Nothing much. How we lived, what we ate, whether we liked it, what was our balance with the State Bank . . .

Did you tell him? Becky felt alarm, and didn't know why. *Did you tell him how much money we had?*

Of course. I expect he has access to the records anyway—they all do. He just wanted to make sure we didn't need to steal from the fields. Maybe he thought we might need state assistance.

And was that all he asked?

That was all. It didn't take long.

Again the misgivings.

It took over three-quarters of an hour, Agatha.

"YOU'VE been a long time." Agatha's voice was petulant. "I thought you were going to help with the vegetables."

"I'm sorry." It was twelve o'clock and the potatoes were simmering on the stove.

"You've been up in your room for two hours."

"Have I? I was tidying up, that's all."

"Dressing up, you mean." Agatha's fingers shook as she sliced bread and Becky watched as the bright knife glittered, glittered with each stroke. "I ought to burn your dress. I ought to."

Becky's silence was the dumbness of guilt. She had been dressing up. She had climbed the stairs thinking about the lost three-quarters of an hour because Agatha had said that she, Becky, had also been alone with the mediman for such a length of time. She couldn't understand it. Time went so quickly, these days, that she had begun to make a conscious effort to live her moments fully, to gather impressions while she could. She knew every feather on every hen, each oddly shaped stone on the beach, every rivet on the Brontomech; she counted them desperately, fearful of the fleeting time. And yesterday she had lost almost three-quarters of an hour.

So she had gone to her room and thought about the past. First she

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thought about her childhood and she took out the old, faded photographs of herself and Agatha at the age of ten, dressed alike, looking alike. What she remembered most about those days was that she was often bored. Frequently there was nothing to do and she and Agatha would sit around grumbling to each other the way children do, willing the minutes to pass until lunchtime. An eternity of minutes stretched between breakfast and lunch... Somehow those had been happy days—almost fifty-five years ago.

At the age of twenty she had married Tom and Agatha had been her bridesmaid and there had been a lot of jokes from the guests about the confusion which might arise in Tom's mind as to identity, under certain contrived circumstances. They would say to Tom: *How would you know it was really Becky, in such-and-such a situation?*

Tom used to enjoy the fun. He would reply: *Didn't you know—Becky's the youngest by twenty-six minutes? I've always fancied the younger girls. Their flesh is firmer.* In point of fact Becky felt that he had chosen her, paradoxically, because she was less efficient than Agatha, more irresponsible.

She had been married in the short white dress of fashion and Agatha had worn powder blue. Since the wedding Becky had never seen Agatha's dress, but her own white dress she had kept in its original box ever since. Sometimes she put it on, as she had done this morning. Once Agatha had caught her wearing it and had spoken rudely, saying that Becky looked obscene; mutton dressed up as lamb.

Agatha's attitude towards Tom had always been reserved—she had seemed almost to keep out of his way and during the ten years of Becky's marriage until Tom had been killed in the Beckenham Gorge monorail disaster she had seen little of her twin.

Then, of course, they had gotten in touch again and had come to live together at Bourton Wash, where they had remained ever since. Agatha never mentioned Becky's marriage, but spoke as though they had always lived together.

"I'M SORRY," said Becky again.

"That's all right," said Agatha with a swift change of mood as she tasted the gravy. She was a good cook, forever delighted with her own culinary efforts.

Later they sat at the table, opposite sides with Esmeralda in her

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box on a third chair. Becky fed the gull with bits of meat which it took delicately from her fingers.

"It's our birthday on Tuesday," remarked Agatha.

"Esmeralda's looking much better today, had you noticed? "I think—" Becky pondered. "I think we might let her out soon. Put her in the yard and see if she can fly. It's cruel to keep her penned up now that she's well again."

"I'll have to bake a cake." Agatha was busy with her own thoughts. "With plenty of icing and sixty-five candles—or a hundred and thirty."

This caught Becky's attention.

"We haven't got that many little candles in the place, Agatha," she objected. "And it would be too expensive to buy them from the Flymart. Why not make do with a candle each? It would make me feel old, seeing all those candles."

"We have a combined age of one hundred and thirty," stated Agatha didactically. "Have you ever thought of that, Becky?"

"It doesn't mean anything," Becky disagreed. "It's just playing with words, adding up for the sake of it. Half of those years are the same years."

"You were saying something about the gull."

"The only thing is, suppose we let her go and she flies away?"

"That would be a good thing, wouldn't it?"

"I don't suppose we'd ever see her again." Becky regarded the seagull. The bird was restless—her eyes were bright. From time to time she shuffled her wings and preened herself.

"Perhaps you think too much of that gull," said Agatha. "It's only a bird. I think you made a mistake giving it a name. Why Esmeralda, anyway? You don't even know if it's a female."

"She just looks like an Esmeralda," said Becky helplessly. "She's company, don't you think?"

"We'll see what happens when we let it outside," replied Agatha enigmatically.

Obscurely Becky felt that there was some sort of competition between her sister and herself and she fingered the bird's neck feathers, gratified that the gull showed no fear.

"I don't see why a bird needs to be useful," she said. "Any more than you or I need to be useful."

"You're thinking about the mediman again. He comes to take care of us and you take care of your bird. Perhaps usefulness doesn't come into it."

"The Brontomech kills every-

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thing that moves. Except humans." Becky's tone was aggrieved.

"Pests are useless."

Becky gazed around the small room with the ancient furnishings. Foam was oozing from a split in the sofa and the carpet showed canvas threads through the pile. Fissures shattered the surface of the ceiling like mosaic and the air was heavy with the stench of crude oil.

"The Brontomech is programed by humans," she said. "Do we have a monopoly on usefulness?"

TWO days later the women were peering into the depths of the well. The water level was high and the surface a kaledioscope of rainbow colors.

"It's oil," said Agatha. "It's oil seeping through somehow. You can't expect a well to be any good so near the sea. And the land's too flat. We ought to rig up a catchment from the roof and drink rain water."

"That would cost money," objected Becky. "It would take time, too. What will we do for water until then?"

"Drink this. We always have used it. We just make sure we dispose of the top inch or so, where the oil is."

"I've always thought our water tasted brackish. I expect the sea's always been seeping in." Becky regarded her sister in alarm. "They say drinking seawater sends you mad. And there's other stuff in sea water—detergents, poisons and so on from the effluent towns." She straightened up, determination on her face. "I'm going to call the mediman," she said firmly. "I'm going to make sure its all right to drink this stuff."

She walked to the house, followed by Agatha.

"We could always ask them to put in a pipe from state land," Agatha was saying. "There are irrigation pipes underneath all of that." She waved a hand at the fence, behind which the Brontomech labored noisily. "You remember, we saw them putting in the pipes years ago."

"They were drainage pipes," replied Becky with unaccustomed acuteness. "The man said they were drainage pipes."

"Don't let's be too hasty over this." The idea of calling the mediman was alarming Agatha. "Let's think about it." She pursued Becky into the house; they were greeted by a scream from Esmeralda. "Let's give Esmeralda a run in the yard."

It was the first time she had referred to the bird by name.

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But Becky had stopped dead at the sight of the knife on the table and disconnected, random thoughts flickered in her mind. There was nothing else on the table except Esmeralda in her box. Somehow it seemed important to get the gull away from the knife, the sharp bright kitchen knife.

Esmeralda was a useless bird . . .

She snatched up the box. Agatha, thinking that Becky had been won over by her powers of persuasion, followed her outside again. Silently Becky placed the box on the bricks of the yard. A few hens ran near, curiously, expecting food. Becky gestured them away and gently tilted the box, allowing Esmeralda to step unsteadily to the ground.

The gull stood still for a moment, head turning this way and that. One of the fowl made a scuttling evil run for her, but Becky nudged it away. Then, experimentally, Esmeralda flexed her wings, flicked them in motions of flight, then refolded them, jerking her tail and shaking the feathers into position. She began to preen herself.

"She's forgotten how to fly." Agatha surmised.

Becky broke her long silence. "No. Look."

Esmeralda had extended her wings again. Neck outstretched she lunged forward, her feet pattering on brick, her wings beating clumsily—she was clear of the ground. She was flying. More confidently now she winged her way around the yard, then climbed until she was a small cross in the gray sky. She hovered, gliding, slipping off altitude, then swooped low over their heads, turning inland.

"Esmeralda!" screamed Becky. "No!"

The roaring Brontomech was lumbering near and the bird flew toward it. Sensors snapped to attention. Needles of light probed the air. Esmeralda veered abruptly, changing direction and struggling for height as her tail feathers streamed smoke, then she swooped past the house again as the Brontomech lost interest. She soared over the beach, paused in mid-air, then dropped towards the sea, wings backing and the embers of her tail spread. At the last moment she must have remembered; she climbed away from the oil-streaked surface, wheeled and landed clumsily on the beach. Becky hurried toward her.

"It's all right, Esmeralda," she assured the bird desperately. "Just don't go near that machine. Or the sea."

As Agatha approached them the bird took off again, flapping a lit-

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tle unbalanced but heading determinedly toward the house.

"She can't understand, you know," Agatha said. "She's only a bird."

A bright tear crept down Becky's wrinkled cheek.

"She seems so much out of place."

They watched as Esmeralda circled the house once, then headed inland over the fence, approaching the Brontomech again. This time the monster ignored her, its attention being absorbed by the seeking out and burning up of some small field animal to its left. The needles of light stabbed the ground spitefully, crackling and flashing.

Esmeralda dived, unintercepted.

"What's she going to do?" cried Becky.

An eye sensor swiveled and glared at the approaching bird balefully. An ear sensor swung to bear.

Esmeralda swooped lower, traveling fast, straight into the jaws of the Brontomech. She was gone instantly, in a puff of pulverised feathers.

Like white smoke.

"I told you she couldn't understand," said Agatha.

Becky was silent for a while as they walked back to the house.

At last she said in a low voice, "Maybe she did understand."

The knife was on the table but the bird was gone.

"Don't talk nonsense," said Agatha.

Becky was at the visiphone, dialing with trembling fingers. The screen cleared and the face of the mediman stared at her coldly.

"Yes?"

"Esmeralda flew into the Brontomech," blurted Becky.

"What on earth are you talking about, woman? Who are you? Identify."

"Becky Harrison. You came to see my sister and me a day or two ago. Don't you remember?"

The face loomed closer on the screen, peering.

"Oh, yes. Old women all look the same to me. What's your problem?"

Becky collected her thoughts. "We've got a well," she explained. "That's where we get our water for drinking. Today there's oil in the well."

"Congratulations," said the mediman sarcastically.

"You don't understand." Becky was desperate. "We've got nothing to drink. We can't drink oily water--can we?"

"You can," replied the mediman smoothly. "It won't do you any harm at all. In fact, it might have a

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slightly beneficial effect. Don't worry about a thing." The screen went blank. He had hung up.

Becky stared at Agatha. Vague fears were clutching at her chest; formless fears which she was unable to put into words.

"What's going on?" she whispered. "What kind of mediman is that? He was laughing at me. And—why did I say about Esmeralda? What put it into my head?"

She sat down abruptly, trembling.

Agatha watched her tolerantly.

"You're all upset about that bird," she said. "You heard what he said. We can drink the water. That's all that matters, really. The bird was just a bird. Cheer up. We'll make a birthday cake tomorrow."

Becky watched dully as Agatha toyed absently with the knife.

THE birthday cake was traditional. Each year they baked the cake together on the afternoon of the day before their joint birthday. They always employed the same system too—Becky would bake the cake while Agatha watched and criticized because Agatha was in fact the better cook, but the cake had to be a joint venture. The decorations were applied by Agatha alone, plain icing with a piped pattern around the edges.

As usual, Becky had forgotten the recipe and Agatha was standing over her as she uncertainly mixed the ingredients.

"More sultanas," advised Agatha.

Something was stirring at the back of Becky's mind and she couldn't identify it exactly, but she knew it had to do with candles.

"Why did you want to put candles on the cake?" she asked. "We've never had them before. It was a ridiculous suggestion." She was annoyed with her own memory, the way she always forgot the recipe for the cake, so she was launching a retaliatory offensive against Agatha. "How on earth can you get a hundred and thirty candles on a cake?"

Agatha was also groping for an elusive memory.

"Did I say that?"

"You certainly did. You were quite serious about it. It upset me. It's not a thing one likes to be reminded about, growing old. I've reached the stage where I forget exactly how old we are and I like it that way—there." she stood back and admired the cake mix. She scooped it into the baking tin and smoothed it over. "That looks good. You'll be able to decorate it this evening."

"Did you call the Flymart?"

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Becky thought. "No. I forgot all about it, thinking about the cake. You call it. I'll put the cake in the oven."

"You know we always have a drink on our birthday," grumbled Agatha as she went into the living room. "And nuts and crackers and things afterward."

Becky opened up the oven and slid the cake inside, congratulating herself that she remembered the temperature setting. She shut the oven door as Agatha reappeared.

"Becky, a strange thing happened. I dialed the Flymart—I'm sure I did—but I got the mediman by mistake."

"Oh? What did he say?"

"He was a bit annoyed—he didn't recognize me at first. I told him we were baking a cake and he said he hoped we enjoyed it and hung up."

Becky felt a small triumph. Agatha had made a mistake.

"I'll do it," she said.

She dialed.

The screen cleared. The face of the mediman appeared.

Becky hung up abruptly.

"You did it as well!" crowed Agatha. "You dialed the wrong number. I saw you. I was watching. Here, let me."

She thrust Becky aside and dialed.

Words appeared on the screen: EASTERN FLYMART. A metallic voice commanded: "Identify and place your order."

Agatha smiled at Becky.

"Agatha Elrood and Becky Harrison, joint account. Party selection including liquor, please. Oh, and general groceries as well, just in case."

"Acknowledged."

The screen went blank.

Becky said, "I'm going out for a walk."

SHE walked slowly along the narrow pebble beach, eyes automatically following the black tide mark. The distance from the house to the northern end of the beach was some two hundred yards and she soon reached the point where the pebbles grew to boulders heaped against a low headland. When the twins had first come to live at Bourton Wash it had been possible to walk around the headland while the waves lapped at one's feet, thus reaching another beach around the corner. Now, however, the flat rocks that constituted this route were so thickly encrusted and slimy with crude oil that the path was unpleasant and unsafe. She had not seen the other beach for years.

She felt a sudden compulsion for a change of scenery, a strange long-

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ing to see again what lay around the corner. She hesitated, unable to bring herself to step on the oily rocks and it occured to her to take the inland route, over the headland itself. She left the water's edge, walked up the beach and onto the coarse grass and followed a narrow path that wound uphill between low bushes. Soon the bushes petered out and she was standing on a broad stretch of grass some twenty feet above sea level. The other beach was in full view, curving slightly and terminating in another low headland similar to the one on which she was standing. The beach looked exactly as she had remembered it, black and narrow, bounded on one side by the sluggish sea and on the landward side by the state fenceline.

In fact, it was identical in appearance to their own beach. She turned around to verify this. Yes, apart from the house, it was the same. At the moment the house was a scene of activity as the bright red Flymart descended from the sky and landed outside the yard in a flurry of scattered flotsam. She saw Agatha emerge from the house and cross the yard, open the gate and examine the goods behind the display hatch. It was a curiously desolate scene despite the momentary activity and a few minutes later, as the Flymart departed and Agatha returned to the house, it was positively depressing, almost menacing.

She pondered and decided that this was because, from the headland, she got the impression of narrowness. Hostile environments seemed to squeeze in on the house from all sides? To the left was the sea, black and filthy and encroaching, pushing up the beach. Then came the tenuous ribbon of their land. And on the right, marching up to the fence, was the state land and the Brontomech. At present the huge machine was busy calcinating with bolts of light a small flock of crows which had dared to alight among the crops.

Thinking of Esmeralda, she walked slowly back to the house. Agatha was in the living room, examining the small pile of articles on the table.

Becky joined her.

"Where's the sherry?" she asked.

Agatha regarded her blankly. On the table was a pound of butter, a box of matches, a loaf, a packet of detergent.

"The sherry," repeated Becky furiously. "And the nuts and the chocolate and all the things for our party. Where are they?"

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"We needed these things here," replied Agatha at last with a look of slight puzzlement in her eyes. "You forgot the butter last time, remember?"

"I know that. We've already discussed that. What about the stuff for the party? That was the whole point of calling the Flymart. Surely you haven't forgotten the party?"

"No, of course not," replied Agatha slowly. "I went out to the Flymart and got what I thought we wanted. I didn't get the things for the party." Her voice rose slightly. "I didn't get them. That's all there is to it. I don't know why. I just—didn't get them, that's all!"

Becky was alarmed at the hysteria in Agatha's tone.

THE two women were meticulous about their birthday party, always holding it at three o'clock in the afternoon. During the morning they were busy with the last preparations and Becky had forgiven Agatha for her lapse of memory over the sherry, particularly as they had found a bottle half-full frm last year. They ate no lunch, contenting themselves with a large, late breakfast—then Agatha finished decorating the cake, a job she had left incomplete the previous evening due to the upset over the sherry. Meanwhile, Becky hung streamers around the room and set out the table.

At three o'clock precisely Becky sat down and Agatha, according to tradition, brought the cake in from the kitchen, set it on the table and sat down also.

"Happy birthday, Becky," she said.

"Happy birthday, Agatha. What does it feel like to be another year older?"

The conversation was traditional, too. As was Agatha's glance at her watch.

"Allow me seven minutes and I'll tell you."

She had been born at seven minutes past three.

Here the conversation departed abruptly from its normal pattern. Becky was staring at the cake, her face pale.

"What did you do that for?" she whispered. "Agatha, why? You've never done it before."

The cake had a circumference of decorative piping—in the center were the words: AGATHA & BECKY, 65 YEARS.

"It's true," said Agatha. "We've had a good happy life and now—"

"But why make a point of it this year? You know how I feel about our age."

"Face up to it, Becky." Agatha's face was curiously blank. She was

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silent for a while. Then: "Excuse me a moment."

She stood up and left the room—Becky heard her steps on the stairs.

Becky sat alone in growing alarm. What on earth had gotten into Agatha? The cake seemed to draw Becky's eyes—the words beat in her brain: *Agatha and Becky sixty-five years. Agatha and Becky, 65 years. . .*

"Where are the pills? What have you done with the pills?"

Agatha had returned; she towered over Becky as she stood beside the chair and her face was older, gaunt.

"Pills?" repeated Becky.

"The pills the mediman left. Where have you put them? They're not in the bathroom."

"No, they're—" Becky broke off.

She had been wondering about those pills, on and off, for days. The mediman had given her an injection for her arthritis. Agatha had had an injection too, apparently, but Agatha didn't suffer from arthritis. What was the mediman doing? She didn't trust him. At the back of her mind the pills held some terrible significance. What were they for? For God's sake, what were they *for?*

Agatha and Becky, sixty-five years. . .

"I don't know where they are," she said firmly. "Sit down, Agatha. You're spoiling our party."

And the tiny voice in her mind whispered: *There's always another way. Death is all around—you only have to reach out . . .*

Agatha sat down, her eyes vacant yet intent, like one who listens to earphones. Agatha heard the voice, too.

She spoke, suddenly in an unnatural tone. "I'll cut the cake."

She picked up the knife, the glittering kitchen knife.

Becky screamed a small helpless scream.

Agatha smiled, a crimson smile from her throat as the blood fountained across the table. Then she fell forward and her head pillowed on the cake and the white icing turned red.

Becky was standing away from the table. She had to glance at the clock on the wall, although she didn't want to, and the clock told her that it was seven minutes past three, ticking a steady *tick, tick,* blending with the drip from the table where Agatha lay as though asleep, having lived exactly sixty-five years.

In accordance with state law.

SO THEN Becky remembered everything. The shock of Aga-

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tha's death separated her conscious will from the subconscious suggestions and she remembered the Euthanasia Act which ten years ago she had been commanded to forget and she remembered what the mediman had said to her on the couch last week.

You are a useless old woman, he had said after giving her the hypnojab, *and you will soon be sixty-five, when you are required to die. I'll give you some pills. . .*

It hadn't worked, not quite, because she had half-remembered the pills and hidden them and she had been scared of the knife for days. And now, with Agatha dead, she remembered everything and was scared of everything.

She looked at the clock again and it was ten minutes past three. She was twenty-six minutes younger than Agatha.

She hurried up the stairs into her bedroom, jerked out the drawer and spilled the contents to the floor: clothing, two jewelry cases, some old letters and the box of pills. She took the box and stumbled back down the stairs, her mind crying, *hurry,* her heart whispering, *slowly!*

She went into the living room trying not to look at Agatha and picked up the knife.

In the yard, the brick-floored normal everyday yard with the hens clucking, she threw the knife and the pills down the well, then went to the shed where the grain was stored. She unlocked the door and stepped inside; her watch said it was fifteen minutes past three. She locked the door on the inside and threw the key out of the tiny, barred window.

Then she sat down on the sack of grain and waited for the command to die.

SHE kept her hands in her lap, twisted them together as she perched uncomfortably on the sack. Her eyes kept moving to her wristwatch but there was no way she could prevent that. A shaft of light from the window illuminated the bench. A hammer lay there and a drill and there was a vise screwed to the edge of the timber. There was nothing sharp on the bench, nothing lethal.

The whisperings in her mind started at three thirty.

You have lived for sixty-five years and it has been a good happy life, but now you are tired. Now you must say goodbye to this life because the struggle to survive is too great. Each day it becomes more difficult to get up, to get dressed, to do the jobs that have to be done. We are all of us human and there is no disgrace in grow-

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ing old—provided we admit it, face up to it. The state is grateful for the very wonderful service you have performed during your lifetime and the state mercifully has provided a way out, now that things have become too much for you.

A lump rose to Becky's throat as she realized how considerate the state was and the tears began to fall as she remembered her own perfidy. She had betrayed the state.

Don't be afraid. Don't be afraid to die—we've made death easy for you. There will be no pain. It will be like falling asleep and you would like to fall asleep because you feel so tired. So very tired after your long good life of service to the state. And remember this is not the end—it is merely a beginning, as you have learned during all your lessons at the State Church. Do you recall those lessons? Of course you do. You were taught well during your childhood and you know in your heart that your departure from this life will mean an arrival in a new and greater life, the life hereafter. A wonderful future lies before you and the key to that future is in the pills the state has provided in its kindness. Get the pills.

Becky had risen from the sack; she was clutching at the bars of the window, sobbing uncontrollably.

"I can't get the pills," she cried. "I threw them down the well. God forgive me, I threw them down the well!"

She tried to force the bars apart. She could see the key lying in the yard.

Sometimes the pills have been accidentally mislaid, but there's always another way. Death is all around—you only have to reach out to find the peace you are seeking. Do it. Do it now.

"I can't!" Becky's frantic gaze traveled around the small shed. "There's no way. Believe me, I want to, but there's no way!"

The hammer, the drill, a few miscellaneous blunt objects—metallic, but small and blunt.

Do it now. you want to. You want to do it now. So do it. Now!

"I want to!"

An axe hung from a nail in the wall. It was a long woodsman's axe and the blade was rusty but sharp. Becky seized it—taken unaware by its weight she dropped it.

Now.

Becky had retrieved the axe; she swung it awkwardly and it crashed into the underside of the bench on the upswing, jarring her arm. She moved away and swung again, her heart thumping, knowing it was useless because she couldn't

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get away from the axis of her own swing. Crying with despair and frustration she stood in the small wooden shed, swinging the axe around her head.

The axe struck the door and the panel shook, splintering. Feverishly she attacked the woodwork. She could smash her way out and there were more knives in the kitchen. She was tiring rapidly. The axe was heavy and kept slipping in her grasp. Her hands were soaked with sweat and she was unable to hold on. The axe, sliding from between her fingers, crashed once more into the door.

The door swung open.

Becky stepped out to the yard.

The house was there, black and tall, and in the middle of the yard was the stone circle of the well. The hens ran to her, clucking. Automatically she turned, went back into the shed and filled the scoop with grain. She threw the grain across the yard and the hens' cackling rose to a crescendo as they fought over the choicest particles.

She watched them, puzzled. There was something she was trying to remember.

She looked at her watch. It was three thirty-five.

The voice in her brain had fallen silent.

Had there been a voice?

IT WAS a long time before she went into the house and then she was able to assure herself that there had been a voice, because Agatha had heard it, too, and Agatha was lying dead across the table. The white tablecloth was stained scarlet and Becky knew she would never be able to get it clean. The place was a mess and she had thrown her best kitchen knife down the well. There was oil in the well, too, and the water tasted funny. She went upstairs.

Standing before the full-length mirror in her wedding dress she admired herself and remembered how Tom had admired her, too, on that bright day many years ago. Agatha had never really liked Tom—there had always been such an awkward atmosphere when the two of them had been together. But now Tom was dead and, she remembered, so was Agatha. They were together in the hereafter... She told herself quickly that was nonsense. She had never really believed all that nonsense they had taught her in the compulsory State Church. After all, how could they *know* that there was a hereafter?

Agatha had said she was mutton dressed up as a lamb. A useless bird. She went downstairs. She stood in the dining room, striking a pose.

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"Now tell me I don't look beautiful, Agatha!"

For once her sister didn't reply.

Which really took all the fun out of it. Depressed, she left the house and stood for a moment in the yard. Over the low wall she saw the sea, black and sluggish and, surely, closer than yesterday? If she went through the gate and walked another fifteen yards her feet would be in that oppressive viscid sludge at the water's edge where the plastic bottles and dead seagulls rolled in the slow waves.

She turned around as the Brontomech jerked into view from behind the house. The wind had shifted and a fine rain of fertilizer and weedkiller drifted across the yard. The monster bellowed, its eye sensors examining her.

She found she was almost running—she had left the yard and was on the rough track beside the beach, heading south, the sea pushing up from the left, the Brontomech closing in on her right. A van was parked on the track, a large white van blocking her way, further restricting her freedom of movement. Beside the van were a number of men and two large boxes.

She stopped abruptly as the mediman walked toward her. He was smiling pleasantly. He beckoned her with a crooked finger and she felt there was nothing she wanted more than to go to meet him and hear his quiet, soothing voice. His eyes were smiling, too, expressing surprised delight as though greeting an old friend. This time, this time he had recognized her—or did he think she was Agatha?

Tom had always been able to tell them apart. The mediman now wagged a gently reproving forefinger as she hesitated.

Behind him the other men waited, leaning easily against the white van. The road to the town was on the far side of the van, turning sharply inland and away from the black crescent of the beach.

She turned quickly, turned around and began to walk back. At the end of the beach was the low headland and beyond it was another beach much the same as this. To her right, a few yards away, the heavy black sea pulsed exhaustedly against the pebbles.

Before she reached the house she turned left and stumbled across the short grass to the state fence.

The mediman watched silently as she climbed through the wires under the inscrutable gaze of the Brontomech; a frail figure in an old wedding dress walking quietly into the jaws of the machine and disappearing in a puff like white smoke. ★

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STORMSEEKER

BOB SHAW

Some flee the lightning. Some boldly challenge it. Some foretell it—and capture it, if they can!

FOR several moonspins now—like a field lying fallow, like a steel blade shedding its fatigue—I have been waiting and resting. But lately a sense of imminence has grown and I have taken to night-riding in the silent sled, soaring over the city's trembling lights or drifting low in a Debussy prelude ambience of moonlight and towers, fulfilling childhood dreams of flight. At times I hover close to stolid old buildings, filling my eyes with the details of their crenels and corbels, but such things look strangely irrelevant when viewed from close anchorage on a tide of dark winds. They produce a sense of unease and vertigo, of a dangerous ending to the volant dream, and I turn the sled away, wondering what the birds must think of us.

Selena has gone with me on several of these aerial excursions, on nights when neither of us could sleep, yet I know they make her unhappy. Percipient to a wonderful degree though she is, a streak of practicality in her nature forces her to question my "profession." We talk about having children—I have been assured I will breed neither mooncalves nor mutants—and while she nods in agreement her eyes grow smoky with doubt. Who could blame her? Only I can sense the ethereal migration of electrons and skry the shadows of lightning flashes yet unborn.

IT IS coming at last—the first storm of the season.

Archbold called me this morning but I had been aware for hours and said so. Even had the weather satellites not fallen dumb in their orbits I would have been the first to know, I told him haughtily. But his sole concern, of course, was that I could deliver.

As a true child of World War

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Three Point Three Repeating, I feel sorry for Archbold. He sits there in his underground rooms like a mole, his whereabouts marked by that single steel mast and the blankets of meshed cable whose oxidation has done odd things to the colors of the surrounding vegetation. The same political and nuclear forces that brought me into being have reduced his kind to their present lowly station. Scientists are generally unloved but GlobeGov is too wise and experienced to ban their activities. All that was necessary was to withdraw fiscal and fiduciary support. Now Archbold, the archetypal physicist, languishes underground, dreaming of the 300GeV accelerator that has lapsed into decay at Berne and relying on biological sports like me.

If the truth were told, some of his colleagues would like to get me under the knife and probe for extra organs or neural abnormalities which might explain my existence. But even Archbold would never countenance dissection of a goose that lays a billion golden eggs in every clutch.

IT IS almost here, this first storm of the season, and I can sense its strength. All day warmly humid air has been streaming upward over the streets and quiet terraces of Brandywell Hill. Water from the sea, the river, the pale rectangular emeralds of the private pools has been swirling aloft into a white anvil of cloud ten miles high. Skrying into the misty universe of cumulo-nimbus I was able to "see" the moisture of its central up-seeking column condense and freeze into hailstones which, having strayed from the geometries of the normal world, were unable to fall. Dancing on the awesome chimney current, they rose higher and higher until the force of the current was exhausted, then spewed out in all directions, carrying cold air down with them. And as the vast process continued my excitement grew, for the electrons within that cloud had begun their inexplicable migration to its base. Up there, not far above the coping stones of the city's towers, they gather like spermatozoa—and their combined pressure grows as irresistible as the force of life itself.

Selena sees nothing of this—but I am delirious with pleasure over the fact that, for the first time, she is accompanying me to meet a storm. Tonight I will be able to make her feel with my senses, let her know what it is like to ride herd on a billion times a billion elementary particles. Tonight I will drink fulfillment from her eyes. Our sled soars high in the fretful air. Selena lies, pale and nostalgic, in the cup beside me as the shivering craft describes slow circles in the darkening sky. But

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for once my eyes are elsewhere.

"Look, my darling." I point down to the patient, shimmering lights of an isolated suburb glowing broochlike in the shape of an anchor.

She looks over the edge and her face is expressionless. "I see nothing."

"There's nothing for your eyes to see—yet—but a ghost is slipping through those houses." I pick up the sled's microphone. "Are you ready, Archbold?"

"We're ready," his voice crackles from the darkness trapped in the hollow of my hand.

"In less than a minute," I say, setting the microphone down. This is where my work begins. I try to explain it to Selena. Above us the cloud is tumescent with electrons as its incredible negative charge increases, and on the ground beneath it an equally great positive charge is formed like an image in a mirror. As the cloud drifts, the earth's positive charge—a shadow only I can "see"—follows it, hopefully seeking its own fulfillment.

The image glides silently and eagerly across the ground, climbing trees, scaling the mossy steeples and towers. It races into houses and ascends water pipes, television antennae, lightning conductors, anything that can bring it closer to its elusive cloud-borne partner. And none of the people and dreaming children and watchful animals can even feel its transient, engulfing presence.

Suddenly Selena is sitting upright—the electrical potential has come so close to orgasm-point that it manifests itself to normal senses. A thin white arm reaches down from the base of the cloud.

"Archbold calls that a leader," I say through dry lips. "A gaseous arc path, reacting to electricity like the gas in a neon tube."

"It seems to be searching for something." Her voice is small and sad.

I nod abstractedly, spreading the net of my mind, once again awed at my power to control—even briefly—the unthinkable forces gathering around us. To our right the leader hangs, hesitating a moment, thickening and brightening as the electrons in the cloud swarm into it. Then it reaches down again, extending to several times its former length. I glance toward the ground and realize it is time for me to act. The activity of the positive particles on earth has increased to the point where streamers of St. Elmo's fire are snaking upward from the highest points. Yearning arms stretch from the tops of steeples. At any second one of them will contact the down-seeking leader—and when that happens lightning will stalk the brief pathway between earth and sky.

"I see it," Selena breathes. "I live."

At that moment I strike with my

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brain, exerting that miraculous power, that leverage which can be obtained only when one's neural system branches into crevices in another continuum. The leader, flame-bright now, changes direction and moves southward to where Archbold is waiting in his underground rooms. On the ground beneath it the positive image also changes course, its white streamers reaching higher, in supplication, in—love.

"Now, Archbold," I whisper into the microphone. "Now!"

His telescopic steel mast, driven by explosives, spears up into the sky and penetrates the leader, absorbing its charge. The ground image leaps forward eagerly but its streamers are sucked down as it encounters Archbold's carefully spread blankets of steel mesh. Both charges—cloud-borne negative and earth-bound positive—flow down massive cables. In an instant their energy is expended, far below ground, in one of the experiments with which Archbold hopes to achieve a true understanding of the nature of matter by accelerating particles to speeds far greater than they ever achieve in nature. At this moment, however, I am not concerned with the physicist's philosophical absurdities and arcana.

"They've gone," Selena says. "What happened?"

I hold the sled on its course with unsteady hands. "I delivered the power of a lightning stroke to Archbold, as I promised."

She examines me with dismayed eyes, her face a calm goddess-mask in the instrument lights.

"You enjoyed it."

"Of course."

"You enjoyed it too much."

"I—I don't understand." As always, a strange sad weakness is spreading through my limbs.

"I won't give you children," she says, with the peacefulness of utter conviction. "You have no instinct for life."

THE storm season is almost over now. I have not seen Selena since that night and I often muse about why she left me. She was right about the nature of my work, of course. There would be no vegetation or animals or human beings on Earth were lightning not there to transform atmospheric nitrogen into soil-nourishing nitric acids. And so by diverting the great discharges into Archbold's lair I am, in a very small way, opposing my mind and strength to the global tides of life itself. But I suspect that my infinitesmal effect on the biosphere is of no concern to Selena. I suspect she has a more immediate, more personal reason for rejecting me.

There is no time to think about such things now, though. Another storm is coming, perhaps the last of the season—and I must fly to meet it. ★

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GALAXY BOOKSHELF

Theodore Sturgeon

Retief of the CDT
Keith Laumer

The All-Together-Planet
Keith Laumer

Dinosaur Beach
Keith Laumer

Chronopolis
J.G. Ballard

Science Fiction— What It's All About
Sam J. Lundwall

Ice
Anna Kavan

The Spun-Sugar Hole
Jerry Sohl

The Sea is Boiling Hot
George Bamber

Farewell Earth's Bliss
D.G. Compton

Arrive at Easterwine
R.A. Lafferty

The Doors of His Face, The Lamps of His Mouth
Roger Zelazny

STRANGE—and a little footcoldening—to be sitting in this particular reviewing stand. Following Algis Budrys in anything but a chowline is pressure on the ego. There are reviewers and there are critics and there are reviewers who pretend they are critics. A.J. is a critic and one of the very best. So much of the man himself shows in what and how he reviews—and he is a good man. I hope he comes back soon.

DO YOU like Retief, Keith Laumer's gallivanting diplomat? Personally I don't, and I don't mind telling you why: I find nothing admirable or amusing about lies and double-dealing, and in addition, a pratt-fall has

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for me more broken back about it than belly-laugh. So perhaps the defect is mine. What slams the ultimate lid on the whole scam is Laumer/Retief's light-hearted callousness toward one species or another of funny little green niggers. When the nineteenth-century empire builders swapped a two-bit jew's-harp for a hundredweight of ivory there was always more in it for them than a favorable balance of trade—it was the arrogant joy of taking advantage of the dum-dums. When you're not sure you're a big man it's lovely to have overt proof that you are; and this, it seems, is a fair description of Retief's marrow. I love comedy, but I confess to a kind of tone deafness in these particular frequencies. When Retief needs a boat and tips all of its occupants into the river so he can steal it, I find myself diverted into wondering whether the natives all made it to shore. Retief and Laumer don't seem to care.

Anyway, if you do like Retief there's a full measure of him around: *Retief of the CDT* from Doubleday, at $4.95—five stories originally published in *If*—and a novel, *Retief's Ransom*—which ran as *If's* complete-in-one-issue novel in the October '71 number under the title, *The All-Together-Planet*—now from Putnam, also $4.95.

What brings all this up, actually, is another Laumer, this one from Scribner's, *Dinosaur Beach* ($4.95). Really another Laumer—another kind of writer altogether. It opens in the venerable hardheeling tradition with a fast throw and a sharp hook and flings the reader straight into good old sense-of-wonder, hard-core sf. It is at this point that this other Laumer emerges, with the hero's meeting The Girl. Not only is he taken with her—the author is, too, and she becomes something real who evokes something tender. Something sexual, too, in the best possible way: the sex is absolutely essential to the plot. Then we go on to a fine spectacular of time-travel and conflict—the kind you don't have to understand; you just ride it. And it ends pleasantly. What fascinated me the most, however, was the repeated surfacing of the good writer. You just can't keep 'em down.

J.G. BALLARD, for example—a writer's writer, surely, and a reader's writer too. Not long ago I came out of the elevator at the local art museum and found myself face to face with five Picasso originals. They were abstractions and though I have no pretensions in the field of graphic art I found myself grabbed and

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held. I once saw some of Picasso's early works—of the "academy" and "blue" periods—and they were meticulously objective, wonderfully wrought, camera-accurate, and I remember how it occured to me that though one may know nothing about art as such, there is still an impact in abstractions by artists who have learned the rules and then "broken" them, which is just not present in work by people who do abstractions because they simply can't draw. I don't know enough about it to be able to tell you just what the difference is, but it is most powerfully there. The same thing holds true of free verse by people who have gone through the agonies of prosody and have learned to write sonnets and *cinquains* and *haiku* and *rondeaux redoubles*. Once they have learned to burnish words through such arduous disciplines their free and unburdened work has a leavening which is unmistakable. Another analogy might be this: for eighteen years you have been carrying, night and day, a forty-pound pack on your back and one day somebody cuts the straps. Man, after that, when you walk you fly.

Ballard shot off a firework in our faces a few years ago with something called *The Terminal Beach*. It's in a new Ballard collection from Putnam called *Chronopolis* ($6.95) and it surfed in on the first crest of the so-called New Wave. It sent the labelers into paroxysms, the traditionalists into fits and the sincerest flatterers to their typewriters. It's a strangely structured thing, original but not unique (the distinction being that not even the author can copy an unique), provocative in its content and effective in its mode. It would seem to many that in some way Ballard was born when he wrote this story; clearly he was not and one has to wonder what he did before, between and around such an extraordinary work. There are many answers in this book. The earliest entry is 1957, *Manhole*, and deals with the psychophysical effects of a brain operation which eliminates sleep. Not necessarily in chronological order, we have straightforward stories dealing with astronomy, biology, biochemistry, physics and, above all, time. The point is made clearly that Ballard had paid his dues as a fine-honed hard-core s-f writer. He has earned his right to write and have people read "more psycho-literary ideas, more meta-biological and meta-chemical concepts, private time-systems, synthetic psychologies and space-times, more of the remote,

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somber half-worlds one glimpses in the paintings of schizophrenics, all in all a complete speculative poetry and fantasy of science." He wrote these words (of which more below) in 1962.

There are few if any stories here cast on that strange endless beach where Ballard and I dwell from time to time, he while he writes them, I while I read them. He believes that place exists or he couldn't write the way he does about it—and I believe every word he says and as far as I am concerned the conviction of the two of us makes it real—and somewhere these driven people of his populate that endless crystal sand, carve clouds with gliders, wear clothes that are alive and neurotic and buy flowers that sing. The seeds, however, of this concept, this "beach country," are here in these earlier works. A world in which the oceans have gone and one in which great masses of Martian desert sand have been dumped on and have buried Cape Kennedy—the science center where a biologist and a cosmologist and some graduate students watch the oncoming death of the cosmos. I know Ballard has made waves; I know he will not stop; I am most pleased to watch where he is going.

The Ballard quotation above was taken from *Science Fiction—What It's All About*, by Sam J. Lundwall, who wrote his book originally in Swedish and translated it himself. The introduction is by Don Wollheim and it's from Ace at 95¢. I find it the most valuable addition yet to the growing shelf of books about sf. Lundwall's European listening post gives him an objectivity we have not encountered before. He clearly loves the field. His reading is very wide (though containing some infuriating holes) and his opinions are hard-held and definite—fine wherever you agree with him. Especially interesting are his surveys of foreign sf—Scandinavian, West and East German, French, Polish, Russian, Dutch. And like all his colleagues, he adds more combustibles to the search for a definition of s-f. (Personally, I am prepared to abandon that effort. The only people who seem able to define it are those who think they never read or see it. They're wrong, of course.)

I MENTIONED "unique" books. I have a shelf of them in my head —A.J. Langguth's *Jesus Christs*, Joseph Heller's *Catch 22*, *The Werewolf of Paris* by Guy Endore and his *Methinks the Lady* (he's the only author who appears

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twice), Wylie's *Finnley Wren* . . . a few others. It's a narrow shelf and candidates for it come along seldom, but one just has. *Ice*, by Anna Kavan (Doubleday, $4.50), has a preface by Brian Aldiss, who knew the author—and I don't know whether to urge you to read the book before reading the preface or not. If you do read the book first the preface makes it almost mandatory that you read the book again immediately because so much of the symbolism becomes explosively clear. The book is written with an exquisiteness and polish I haven't seen since the late Isaac Dinesen; in all other respects the author's modus is strictly her own. It's one of those rare reading experiences wherein you read three paragraphs past something, skid to a stop and say "*What?*" and go back and do it over. She very soon lulls you into simply accepting her narrative wherever it goes. That's called spellbinding. And once you've put it down, it will be with you as long as you live.

BRIEFLY noted: You'll deeply enjoy *The Spun Sugar Hole* by Jerry (*Night Slaves*, *Costigan's Needle*) Sohl (Simon & Schuster, $6.95)—a mainstream novel with a delightful thread of sf all through it. It's a romp and crazy as hell, but a provocative romp which sheds a bright and multicolored light on a lot of profound humanity . . . Watch D.G. Compton, absolutely certain to be one of the big ones. He wrote *Synthajoy* and *The Steel Crocodile* and now, from Ace (95¢), gives us *Farewell Earth's Bliss*, a novel with a sting in its tail: look out! . . . Also from Ace, at 75¢, George Bamber's *The Sea is Boiling Hot*, a well-paced, well-sexed, timely and tumbling damn good story . . . The only reason R. A. Lafferty's *Arrive at Easterwine* doesn't make the "unique" shelf is that, astonishingly, I believe Lafferty could to it again. He has to be the maddest, the most colorful, the most unexpected, the most outrageous writer alive. He's totally drunk on words and he really and truly doesn't give a bleep where he goes with all this. It's from Scribner's and goes for cheap at $4.95 . . . You'll be glad to know that you can have in one package, from Doubleday ($4.95), fifteen of Roger Zelazny's beautiful yarns, including as the title story *The Doors of His Face, The Lamps of His Mouth*. The story that still makes me weep, *A Rose for Ecclesiastes*, is included.

God willing, I'll be back with news on collections and anthologies. It's been a rich season. ★

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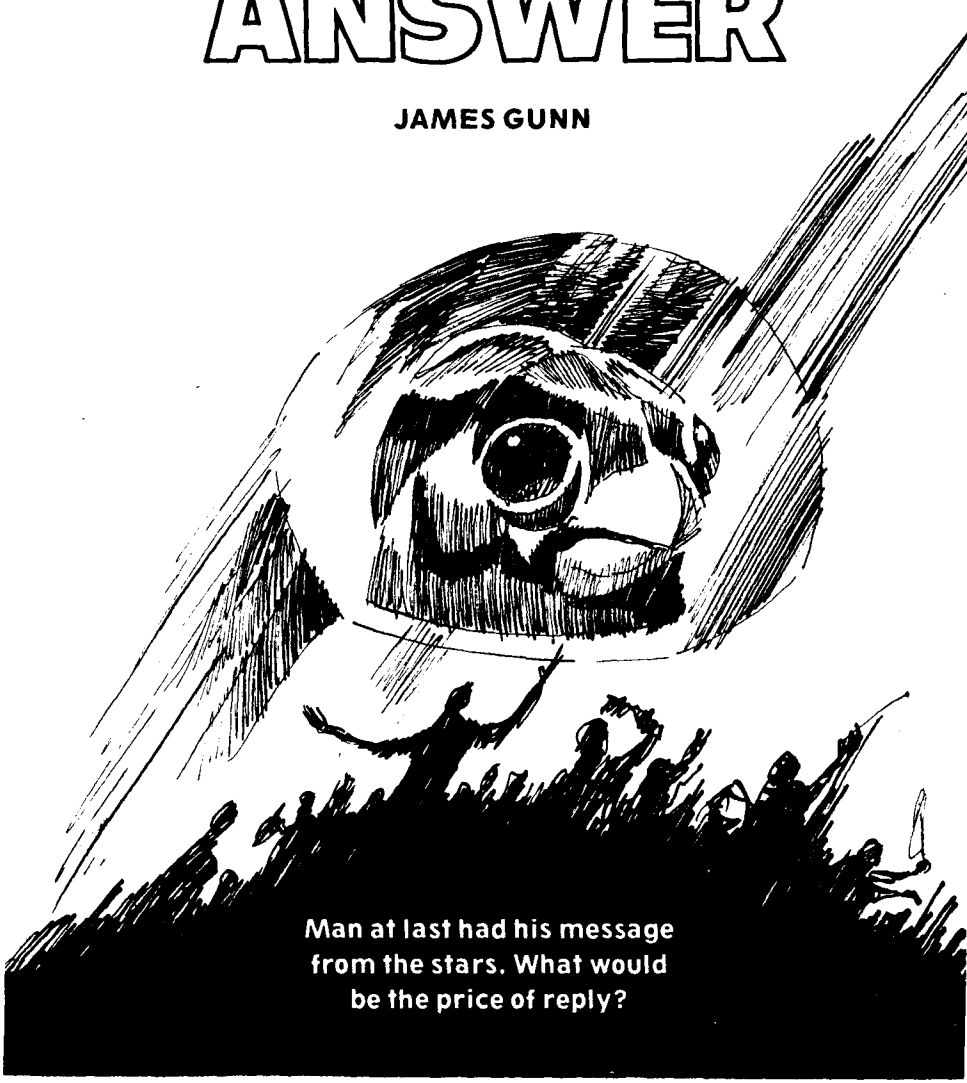
THE ANSWER

JAMES GUNN



Man at last had his message from the stars. What would be the price of reply?

DIAGRAMS ON PAGES 130 AND 145 BY LANCE WILLIAMS

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I

"Tell them I came and no one answered,
That I kept my word," he said.

THE office was big. Too big, Andrew White thought. Across the broad, blue, deep-piled carpet with the woven seal in the middle to the carved, white door by which visitors entered was a good twenty yards—more distance than could have been traversed in the entire flat in which White had been born—and people who came in that door were diminished, like Alice.

That was the way it was intended, no doubt. Space equals importance. And who was more important than the President of the United States?

Everybody, White thought.

The President of the United States is a lonely man, White began to compose in his head. *He takes unto himself all the loneliness of the people he serves. And he is a lowly man. Every citizen is higher than he is. He exists to sign his name to other men's decisions, to shoulder the blame when things go wrong. He is a figurehead and a scapegoat. Fellow Americans, I have made my decision. I will not run for a second term . . .*

But he would, he knew. He would not run away from his duty and his duty was to complete the job his predecessors had begun more than fifty years ago. The job was not done, God knew, and it was becoming harder all the time to tell people what was wrong, to show them the way it had been, to convince them that the battle needed to be fought anew each day, that peace was an illusion.

Maybe, he thought, *it is the ghosts of the other men who have occupied this chair that haunt me today, that make me feel small . . .*

He stretched his shoulders and felt the long, flat muscles rippling under the layer of fat too many chicken dinners had put there. He knew he was a big man, an imposing President, six feet, six inches from the soles of his feet to the top of his 'fro, and the physical equal of any of them—of any man who came through that door.

Perhaps it was the smell of the place, the smell of fresh air untainted by the odors of cooking food or of other people, the smell of paper and ink, of electrical gadgets functioning noiselessly to bring information or send orders, the smell of power—everything was changed from what he had known as a boy, as a young man. The scent of the freshly

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mown grass made him turn his back on the door and look through the broad windows behind the desk toward the green lawn and the leafy trees and the fence, beyond which ran the broad streets and rose the tall towers of Washington, which had replaced the familiar ghetto he had fought to escape—and found himself remembering frequently now as if he had been fond of it, as if it had been a happy home.

He thought how wonderful it would be if he could take off his shoes and walk barefooted in the grass the way he used to do in the park when a boy. What a fine picture that would be—the President walking barefooted on the White House lawn—and he knew if he did it the picture would be reproduced in one hundred million homes across the nation and the world and it would win him votes. The people liked to think of a President's being impulsive when it came to matters of the heart, a bit comic in domestic affairs, a bit inferior to each of them in some way. But he knew he couldn't do it. He would not have time. He had no time now for anything that he liked to do.

HE HEARD the door open and turned. John stood in the doorway. He was a good-looking man, White thought. He got his good looks from his mother and his size from his father. Maybe a little conservative in his dress and hair style but a good-looking brother all the same.

"Dr. MacDonald is calling from the Project," John said. His tone was stiff.

John still recalled last night's conversation, White thought, and knew suddenly why he felt depressed, why he felt like resigning, why he felt like giving up. It was because of John.

"Who is Dr. MacDonald?" White asked.

"The director of the Project in Puerto Rico, Mr. President," John said. "The one that's been listening for radio communication from the stars—listening for more than fifty years. They picked up something a few months ago that sounded like a message from—some star or other, I forget. From what MacDonald says I gather they've got a translation."

"Good Lord," White said. "Have I met him?"

"Once or twice, I think—at a reception at least."

White sighed. "Put him on." He had a feeling of impending disaster. Maybe that was what everything had been leading up to today.

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He felt his stomach sinking under a cold weight as a window opened between his desk and another in a distant room. The face of a man a bit past middle age looked at White. The man's hair was sandy with little apparent gray and his face was calm and patient and worn. White had seen the face before, he recognized, and remembered that he had liked the man on sight. Now he sympathized with the man's problem, whatever it was—he caught himself before he committed himself too far.

"Dr. MacDonald," he said. "So good to talk to you again. How are things in Puerto Rico."

"Mr. President—" MacDonald said and paused either to weigh his words or better to control them. "Mr. President, this moment is as historic as the one that first gave us atomic reaction. I wish I had some memorable phrase to announce it, but all I can say is that we have received a message from intelligent beings on a world circling one of the twin suns of Capella—and we have a translation. We are not alone."

"Congratulations, Dr. MacDonald," White said automatically. "How many people know about this?"

"I was going to tell you—" MacDonald began and then broke off. "Fifteen," he said. "Perhaps twenty."

"Are they all there?" White asked.

"They've scattered."

"Can you get them back together? Immediately?"

"All except Jeremiah and his daughter. They left a few minutes ago."

"Jeremiah, the Solitarian evangelist?" White asked. "What was he doing there?"

MacDonald blinked. "His opposition was a threat to the Project. He saw the message translation come off the computer printout and is no longer opposed. Mr. President, the message—"

"Get him back to your office," White said. "He must not reveal the message, whatever it is, nor will you or any member of your staff."

"And what about an answer to those who sent it?"

"Out of the question," White said brusquely. "There will be no announcement, no leaks, no answer. The effects of what you've told me may be incalculable. I must consult with my people. I suggest you do the same."

"MR. PRESIDENT," MacDonald said, "I think you are making a serious mistake. I urge you to reconsider. Let me

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give you the background, the goals, the significance and meaning of the Project."

White paused and thought. Not many people told him he was wrong. John sometimes did—he and this man MacDonald could be difficult. White knew he should cherish the nay-sayers, but he found them a trial—he disliked being told he was making a mistake.

Teddy Roosevelt, someone had written, made up his mind somewhere in the region of his hips and that was the way with Andrew White, he thought. He did not always know where his decisions came from, but they almost always were right.

He had to believe in his hips. "I'll come to the Project," he said. "You can try to convince me." There—that was all the scientists really wanted, a chance to be heard. "For security reasons I can't specify the time and you will not tell anyone else. But it should be within a few days." He broke the connection.

"John!"

John appeared in the doorway. "I'm making the arrangements now," he said. "And I'm having a brief history of the Project put together for you."

"Thank you," White said. John was a good man and an indispensable assistant, he thought. "You'll go with me, won't you?" he asked humbly.

John nodded. "If you wish," he said. But he was still reserved.

After the door had closed again White thought that perhaps the trip would let them get back together again, give them a chance to talk to each other, really to communicate instead of using words like stones.

And then John was once more in the doorway. "Dr. MacDonald called back," he said. "The private plane carrying Jeremiah and his daughter back to Texas already had taken off when he was through talking to you."

White thought briefly about the possibility of intercepting the plane, of having Jeremiah put into custody as he landed, of having the plane shot down at sea on some pretext or other. But it felt all wrong.

"Leave an urgent message for him at whatever his destination is. He's to be told that I want to talk to him before he does anything about the message. And reroute us through Texas."

John hesitated in the doorway. "Father," he said, paused and continued: "Mr. President, Dr. MacDonald is right. You're making a mistake. This is a scientific decision, not a political one."

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White shook his head slowly, sorrowfully. "Everything that touches people is political. But to avoid mistakes is why I'm going to the Project—to give Dr. MacDonald a chance to convince me I'm wrong."

The words contained only a half-truth. He was going to Puerto Rico to make his decision stick. And for other reasons he himself had not yet fully explored. He knew the truth about his natives—and so did John.

Damn it. Why couldn't the boy realize that it wasn't intelligence or even wisdom he was talking about; it was just living. He had been there. He had been young and he knew what it was like.

He wanted to save John pain. John had never been middle-aged.

"Those times are finished, Father," John had said. "They were fine; they were great; they were necessary like the pioneers; but they're over. You've got to know when the frontier is gone, when the battle is ended. You've won. There's nothing as unnecessary as a soldier when the war is over. It's time to do something else now."

"I've heard that all my life from people like you—from quitters," White had yelled. "It isn't over; the inequalities haven't been removed—they've just become better hidden. We've got to keep fighting until we've got a final victory, until there's no chance of its slipping away from us. You've got to help, boy! I didn't raise you to pass . . ."

But what he should have said was, "I need you, son. You're my link to the future, the reason for all I think, all I've done."

And John would have said, "I never thought of it like that, Father . . ."

Why didn't the boy ever call him Dad?

II

THE trip from Washington to Texas, from catapult to touchdown, was short and uneventful, no longer than it took John to read aloud to White a brief report on the Project. White sat in his chair, head back, eyes closed, listening to the muffled whine of the air trying to find a hold on the polished metal skin a few inches away, and hated being separated and alone. He detested mechanical and electrical devices that kept him away from people, that hurtled him here and there, that insulated him from the world, and he was surrounded by them—he couldn't get away from them.

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As he listened to John's voice reading the report he heard the boy become interested, get involved, and he wanted to say, *Stop reading. Stop telling me these dull things that I don't want to hear, that will only add to my loneliness. Don't waste your passion on these pointless projects—save it for me!* Stop reading and let us talk about matters more suited for a father and son—about love and the past, about love and the future, about us. . . . But he knew John would not approve. He would not understand. So he listened to John's voice.

The Project had been launched in the late seventies to listen for possible messages from other intelligent beings in the universe. Considerable discussion of how such communication might be transmitted and what the nature of the message might be had preceded the Project during the late fifties and sixties. There had even been a three-month trial run, given the name Project Ozma, by astronomer Frank Drake using the 85-foot steerable radio telescope at the National Radio Astronomy Observatory at Green Bank, West Virginia. The Project had been set up with the expectation that it might have to operate for several decades without results. Scientists had felt certain that within our galaxy alone, out of billions of stars some would have habitable planets, some could have intelligent life and even a technological civilization capable of sending or receiving signals between the stars. But it would take time to check them all and to test all the reasonable methods of communication.

The first three decades of the Project had been troubled. Possibly, since listening was easier and cheaper than sending, everybody everywhere was listening. Enthusiasm on Earth had leaked away over the years as all the efforts, all the imagination, produced nothing but silence; directors came and went; morale was a constant problem; funding became perfunctory. Then MacDonald had come to the Project and been named director. Still no messages were received—or recognized, if received—but the Project was pulled together, earlier concepts of the long-term nature of the task were reinforced by new thinking and the search went on.

Then, fifty years after the Project was begun, a Project scientist checking tapes of the routine radio telescopy from the giant radio telescope in orbit around the Earth, the Big Ear, thought he

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heard voices. He filtered them, subtracted noise and interference, reinforced the information and heard snatches of music and voices speaking English.

They were bits and pieces of radio programs broadcast on Earth during the thirties and picked up, apparently, some forty-five light-years away and rebroadcast toward Earth from the direction of the twin red giant suns called Capella.

But this was not the message—it had been merely the "hello," the attention-getter, and the message had not been deciphered until now.

THE plane landed in Houston. White's first question to the officials who were waiting to greet him was, "Where's Jeremiah?"

They were embarrassed. One of them finally gave him Jeremiah's message. "If the President wants to see me he knows where he can find me."

White sighed. "Take me to Jeremiah," he said.

They argued, but they took him through the clean wide streets of Houston and up to the incredible dome that was called the temple of the Solitarians and down underground passages, dusty and dark, until they reached a small room that seemed even smaller under the oppressive weight of the stadium above.

The old man looked up from an old makeup table and mirror. His hair was white, his face was lined and his eyes were dark, and White knew at once that he would not be able to move the evangelist. But he had to try.

"Jeremiah?" he asked.

"Mr. President?" Jeremiah said in a "render-unto-Caesar" tone.

"You have returned from Arecibo," White said, "with a copy of a message."

"I returned with nothing," Jeremiah said, "and any message I received was addressed to me alone. I cannot speak for any other man."

"I speak for many other men," White said. "And in their name I ask that you not reveal your message to anyone else."

"So might Pharaoh have said to Moses when he came down from Mt. Horeb."

"But I am not Pharaoh and you are not Moses and the message is not the Ten Commandments," White said.

Jeremiah's eyes burned. His voice, in contrast, was curiously gentle. "You speak with a greater certainty than I can pretend to. You have legions—" his glance

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flickered briefly over the guards and assistants who crowded the doorway and the hall outside—"and all I have is my solitary mission. But I will fulfill it unless I am physically restrained and I will fulfill it this evening." At the end his voice had not seemed to change, but now it was smooth hard steel.

White tried one more time. "If you do this," he said, "you will be sowing dragon's teeth of dissension and strife that may well destroy this country."

A smile twisted Jeremiah's face and was gone. "I am not Cadmus and this is not Thebes—and who knows God's plan for man?"

White started to leave and Jeremiah said, "Wait." He turned back to his dressing table and picked up a piece of paper. "Here," he said, holding it out. "You will be the first to receive the message from the hands of Jeremiah."

White took it, turned and walked the long echoing corridors back to the cars and said to the anonymous men who escorted him, "I want full coverage." He boarded the plane to continue his journey to Puerto Rico.

JOHN had a recording of the voices. First came only whispers. They were faint but complex like a blending of thousands of lips and tongues. Though they might have been made without lips and tongues, by creatures who had no familiar organs but communicated by humming in their thorax or rubbing their antennae together.

White thought about the long years of listening to this and wondered how men had endured it, had not gone mad.

The whispering grew louder and became the sound of static, miscellaneous sound, noise, and then something more, something coming clearer, something almost intelligible, began to come through, reminding White of times when he had been a small boy lying in bed nearly asleep and people had been talking in the next room. He had been unable to make out what they were saying and unable to rouse himself enough to listen.

Next, from John's tape, came snatches of music and bits of voices saying broken sentences between the static.

"POPCRACKLEPOP," they said. "Voss you dare shar CRACKLEPOP you have a friend and adviser in CRACKLE CRACKLE music POPCRACKLEPOP another trip down allens POPPOPCRACKLE stay tuned for POPCRACKLE music: bar ba sol bar POP you termites flophouse CRACKLEPOPPOPPOP at the chime it will be ex CRACKLECRACKLEPOP people de-

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fender of POPPOP music POP-CRACKLE the only thing we have to fear CRACKLE and now vic and POPPOP duffy ain't here CRACKLEPOP music POP-CRACKLEPOP information plea CRACKLECRACKLE music: boo boo boo boo POP-POPCRACKLE can a woman over thirty-five CRACKLEPOP-POPPOP adventures of sher POPCRACKLECRACKLE music POPPOP it's a bird CRACK-LE only genuine wriglies POP-CRACKLE born edits the news CRACKLECRACKLEPOP hel-lo everybody POPCRACKLE-POP music POPPOPCRACKLE that's my boy CRACKLE check and double POP. . . "

"The voices," White said after the silence returned.

"The voices," John agreed.

White noticed that they had said the words differently, that John's tone had been excited and pleased. White was not pleased. He was disturbed at the thought of creatures somewhere out there with apparatus—forty-five light years from here—listening to the sounds of Earth, alien ears listening to the voices of Earth and sending them back again transmuted, dirtied. He had been on television often and recently on radio as well—since its revival—and he did not like to think of his voice and picture fleeing on restless waves through space for anyone or anything to intercept and possess—a part of him. He wanted out of having to believe.

"Maybe the voices are just a reflection," he said.

"From forty-five light years away?" John asked. "We'd never pick up a thing."

White tried to imagine the incredible distances between the stars that the voices must have traveled to reach that far place and return. He could not. He thought about an ant walking from Washington to San Francisco and back and that was not enough.

"Maybe it's closer," he said.

"Then we wouldn't be getting the program from ninety years ago," John said.

"Maybe it's been floating around in the atmosphere all these years," White said, waving his hands in the air. "Oh, I know. That's impossible, too. Only it's no more impossible than thinking of aliens sending us messages."

Or this, he thought. He looked at the piece of paper Jeremiah had given him. There was a drawing on it, black ink on white paper—it looked as if it had been done by a talented amateur. Perhaps it had been drawn by Jeremiah himself. It was a drawing of a stylized angel, wings spread behind, arms

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stretched in a kind of welcome or acceptance, its face peaceful. It was an angel of mercy, of love, carrying a message of God's love, and it was surrounded by a border of entwined flowers.

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By what impossible magic, White wondered, had the voices been translated into this?

"The whole cosmological picture," John was saying, "makes the contact believable. There had to be intelligent life out there. This tape would be impossible if there were not other creatures in the galaxy, intelligent enough, curious enough, and capable of communicating with us across the light years, wanting, needing to find other creatures like themselves who could look at themselves and at the stars and wonder--"

White was caught in John's vision for a moment. He looked at his son's face and saw the excitement in it, the raptness, and he thought, *You're a stranger to me and I cannot speak to you. . .*

He loved the boy—that was the trouble. He didn't want to see him get hurt the way he had been hurt. He wanted to save him the torment, save him from learning things the hard way. That was the essence of humanity, being able to learn from the mistakes and successes of others, not having to learn it all over again each generation. He knew what John would say. "You're just following instinct. Being human is being able to do something different."

Why was it always like this? The boy was an alien, but somehow he had to communicate.

PUERTO RICO was silent. As the powerful black car that had met him at the airport sped over the dark roads White was aware only of the quiet hum of the steam turbine, the smells of trees, grass and sea.

This was better than Washington, he thought, and better than Houston. Or any place else he could think of where he had been recently. The concern that kept coiling tighter in his stomach like the spring of a wind-up toy began to relax.

What had happened to all the wind-up toys he had known when a child? He wondered. Replaced, he thought, by battery-powered toys. Perhaps he was the last of the wind-up toy people. A wind-up President, he thought—wound up tight in the ghetto and now working out all the frustrations and aggressions that had pushed him into the White House.

Wind him up and see him right the ancient wrongs—but carefully, carefully, so that domestic tranquility is not disturbed, so that international peace is not threatened. . .

He laughed a bit ruefully and thought that something in that office in Washington did not let a

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man be what he had been or what he wanted to be, but forced him to be a President.

John was looking at him and he realized that John had not heard him laugh for a long time. He leaned over to put his hand on John's.

"It's all right," he said. "It was just a passing idea."

And he thought, *I could be a better man here. Maybe not a better President, but a better man.*

"We're almost there," John said.

White took his hand away. "How do you know?"

"I've been here before," John said.

White settled back in his seat. He had not known that John was familiar with this place. He wondered why he had not been told about John's visit to the Project. What else about John was a secret, a mystery?

THE mood passed. When the Project appeared out of the night, glimmering and vast and strange in the moonlight, White turned from it and would not look at it. The car pulled up beside a long, low concrete building.

MacDonald was waiting for him inside the building. Again White knew a surge of empathy toward the man. He felt sorry that he had to kill what MacDonald had given his life to.

MacDonald escorted the Presidential party down the painted concrete corridor. "Mr. President," he said, "you do us honor." But he walked casually and talked easily as if this party were no different from any of the others he had guided on night tours.

The corridors were busy. Men and women were moving purposefully, as if it were the middle of the day instead of the middle of the night. And abruptly White realized that this was the busy part of the twenty-four hours for the Project—listening was best at night. What would it be like, he wondered, to have the days and nights always reversed? To have light and dark turned around like a bat or an owl? And he thought that he should know the answer to that as well as anybody.

People passed. MacDonald did not introduce any of them, perhaps sensing, without being told, that this was an unofficial visit—or perhaps not wanting to stir up speculation in the Project about his visit. But some of the staff members glanced at White, then glanced a second time with a shock of recognition. White was used to that. And there were some who were busy talking to each other and glanced at him and continued

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their conversations without a pause. White was not used to that. He discovered that he didn't like it. He had thought that it was his loss of anonymity that he disliked, but he realized that he disliked more not being recognized at all.

He also disliked the sterile corridor, echoing with footsteps and voices, and the room filled with electronic equipment through which he was ushered. He recognized oscilloscopes and recorders, but much of the equipment was alien to him and he was pleased that it should remain so. A man was sitting in front of a panel with earphones over his head. MacDonald waved to him as they passed and the man waved back, but his eyes were glazed as if they were focused on something hundreds of miles away. Billions of miles—light-years, White corrected himself.

He was ushered through another room that was virtually all computer. The walls were one great computer—cables snaked into other rooms and the floor was crowded with data inputs and printers. It was the biggest setup of its kind White had ever seen, bigger even than the Pentagon's or the State Department's simulators or the Information Department's data files. The place smelled of oil and electricity and it talked to itself of information and events and correlations, of shoes and ships and sealing wax and it added one and one and one very fast, over and over again. Being in that room was like being inside a computer—White felt himself to be a modern Jonah inside a great fish not yet born and he was relieved when it opened a mouth and spat him out into an office.

The office did not reveal the evidences of a man's life, of twenty years of effort and dedication. Like the rest of the building it was plain. A simple desk was set in front of tall book shelves built into the wall and the shelves had real books on them with leather bindings. Some of the books had titles in foreign languages and White remembered from John's briefing that MacDonald had been a linguist before he became an engineer.

"Set up my information center," he said to John.

"You can plug it right into the computer," MacDonald said. "My assistant will show you where."

White and the Project director were alone. They faced each other and White hardened his heart against the man.

If MacDonald recognized the situation he did not acknowledge it. Instead he asked casually, "Jeremiah?"

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White shook his head. "He refused to be moved. He is going to release the message to his faithful. His message, he called it."

MacDonald motioned him to a chair. "And so it is," he said. "His message, my message, your message."

White shook his head. "Not my message. Here is a copy of his message." He handed MacDonald the piece of paper Jeremiah had given him.

MacDonald looked at the drawing of Jeremiah's angel, pursed his lips and nodded. "Yes, that's what Jeremiah saw. You didn't stop him?"

"Some things a President can do and should do. Some he can do and should not do. Some things he cannot do. Stopping Jeremiah falls somewhere between the second and the third. But that—" he indicated the piece of paper—"can't be the message."

"How much do you know about the Project?" MacDonald asked.

"Enough," White said, hoping to forestall a repetition of John's briefing.

"You know about the long listening without results?" MacDonald asked.

"I know all that," White said.

"And then the voices?" MacDonald pushed a button on his desk.

"I've heard them," White said, but he was too late. The voices had already started.

III

THE acoustics were better here or something had been lost on John's tape. The whisperings that began it were more urgent here—they held a note of pleading, of insistence, of anger, of despair. They shook White so that when they became the voices he relaxed as if the effort to hear and understand had taken all his strength. The voices, too, were a little different, as if they started at another point in an endless loop, and they were more distinct.

POPCRACKLE ice regusted CRACKLEPOP music: that little chatterbox the one with the pretty POPPOPCRACKLE wanna buy a duck POPCRACKLEPOP masked champion of justice CRACKLEPOPPOP music POPPOPPOPCRACKLE ter eleven book one hundred and POPCRACKLEPOP here they come jack POPPOP music CRACKLE yoo hoo is anybody POPCRACKLE is raymond your POPCRACKLEPOPPOP music POPPOPCRACKLE music: wave the flag for hudson CRACKLEPOP um a bad boy POPPOPPOP lux presents holly CRACKLE-

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CRACKLE music POPPOP-CRACKLE rogers in the twenty POPCRACKLEPOP music: cola hits the spot twelve CRACKLE. . .

White shook himself to break the spell. "That wasn't the message," he said.

MacDonald adjusted a dial on the desk. The voices continued in the background like a distant Greek chorus commenting on their predicament.

"That was only what they used to attract our attention."

CRACKLE CRACKLE POP hello everybody POPCRACKLE-POP. . .

"The message was in the static between the voices," MacDonald continued. "When we slowed it, stretched it, the static turned into a sound and silence pattern that we tried to decipher for months."

POPCRACKLE ice regusted CRACKLEPOP

"I'se regusted," White repeated in a deep voice and laughed.

"You know that one?" MacDonald asked.

"One of our folk heroes," White said in a self-deprecating tone. "Does it bother you to have a black President?"

"About as much," MacDonald said, "as it bothers you to have a white Project director."

MacDonald was not only wise; he was shrewd. He knew that differences existed between men and these differences inevitably affected how they felt about each other, about themselves. White had liked MacDonald from the start—now he was beginning to admire him and that was dangerous.

What John wanted to do was even more dangerous. He thought there were no more differences, that he could forget his color and his people, that he could live like a white man, concerned with himself alone. How could John be so blind to the realities of racism? The old hatreds and prejudices were merely hidden better now. You still had to be on guard; to trust yourself in their world without the protection of power or of righteous anger was to risk your soul. His son—Andrew White's son—could not go over.

"FINALLY it came to us," MacDonald said. "Those dots and silences between the voices could be translated as spaces filled and unfilled, like a crossword puzzle. The computer finally worked it out, figured out the length of the message—where it began and where it stopped and what was false—static, noise—and what was the real message endlessly repeated. And it printed out the message for us."

MacDonald reached for a frame

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that until now had been face down on his desk. White had not noticed it before. How much else had he not noticed? Had he missed something that might have enforced his stance in this matter?

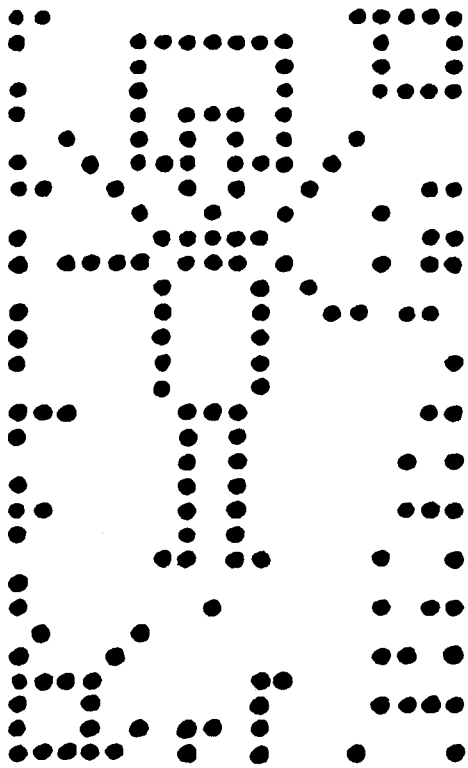
"Here it is," MacDonald said. He turned it over and reached it out to White. "This is the original message, the first one transferred from electronic signals in the computer onto paper. We had it framed for you—we thought you might like to keep it for a while, to look at, to wonder about a bit, perhaps, and when you're finished with it, when you're tired of showing it to visitors, you might send it over to the Smithsonian."

White took the frame reluctantly as if the message were one he did not really want to receive, like a summons or a subpoena or a warrant. He did not want to look at it or wonder about it—he did not want it translated for him. He wanted to destroy it, to forget it. It was bad news and he understood the Egyptian tradition of executing the messenger who brought evil tidings.

He looked at the message. It consisted of little marks scattered in random fashion across a blank sheet of paper.

White looked up. "This is a message?"

MacDonald nodded. "I know it's



not impressive at first glance. What is impressive is its origin in the minds of alien creatures born under two alien suns—red giants—forty-five light-years from here. That's how far it traveled to reach us, to reshape itself into the picture you hold in your hands."

"It's still not much," White said,

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turning the frame over to look at the blank back as if there might be something more important, more revealing, on that side.

"Perhaps it doesn't seem like much," MacDonald said patiently, "but the information contained in that sketch is surprising. 'A picture is worth a thousand words,' the Chinese are reputed to have said, and we can learn at least that much more from this than from words—in some arbitrary symbols—even if we could read the symbols. What we have consists of five hundred and eighty-nine dots and dashes, dots and blanks, a grid made up of nineteen spaces across and thirty-one spaces down—and in those spaces the Capellans have drawn a portrait of themselves."

WHITE looked at the message again. He was beginning to see forms and shapes in it and realized that his first reaction had been conditioned by his desire to believe that the computer marks were random, that the message was, in fact, meaningless.

"Damn poor portrait," he muttered. "Like the stick figures children draw."

"Or like the figures adults draw for children, the kind of images children can identify because they can draw them—the kind of pictures you must draw with a blunt crayon or a grid. It looks like something intelligible even to the unsophisticated."

White glanced up, amused. "Like me?"

"Like you. But unlike most stick figures, this picture rewards study. Much about it still is ambiguous, but some of what it means seems reasonably clear. In the lower left-hand corner is a square four spaces to a side; another one is in the upper right. Those probably are suns."

"Two suns?" White said and then felt foolish. "Of course. Capella has two suns. John told me and you told me, but I can't seem to remember things like that."

" 'My words fly up, my thoughts remain below,' " MacDonald quoted.

" 'Words without thoughts never to heaven go,' " White continued and enjoyed the look of admiration and new respect in MacDonald's glance.

"Below the symbol in the upper right is a smaller square with single marks and double marks seemingly grouped around it. If a large square is a sun, a smaller square is a—"

"— planet," White supplied.

"That's right," MacDonald said.

White felt as if he were back in school and had just received the teacher's approval.

"And those single and double

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marks," MacDonald continued, "probably are satellites of the big planet. Theory suggests that only large superjovian planets would be able to maintain an orbit in a double-sun system. Life on a superjovian seems unlikely. But a superjovian could have earth-sized satellites on which an intelligent race of creatures could evolve. And the Capellan—if that is what he is—seems to be pointing with two of his, or her, arms—or an arm and a wing—toward one of the suns, the one in the upper right-hand corner, and one of the satellites, if that is what they are. The implication is: this is its sun—not the other, which may be at a considerable distance—and this is its home world."

White nodded. In spite of himself he had become involved. "Ingenious. Almost like a detective story." He felt MacDonald's eyes on him and realized he was being played upon and enjoyed it.

"We've been working at it, trying to put together the clues and solve the mystery," MacDonald said. "I have an excellent staff, Mr. President—dedicated, brilliant, much more capable than I. My job is to keep them supplied with pencils and rubber bands and paper clips."

"I know that feeling," White said dryly. How much about him did MacDonald know? How much did he guess? How much was common to all administrators?

MacDonald spoke again, more rapidly now, as if hastening toward a climax.

"Below the satellites are numbers from one to nine written in a binary system, establishing a system of counting, the beginning of a common mathematics—and the fact that the Capellans' intellectual processes are similar to ours. Down the left-hand side are what appear to be words—numbers on the right, words on the left; numbers written horizontally, words with a vertical component."

"Why words?"

MACDONALD shrugged. "We're still guessing about a lot of things. Perhaps they're building a vocabulary for later use when a word may be worth at least one picture, perhaps words are necessary to make a statement in the message that we have not yet deciphered—perhaps they help explain the picture."

"What are the words? Can you decipher them?"

MacDonald pointed at the picture in White's hands. "They seem to apply to something that is on the same line or lines with them,

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usually to their right. Let's skip the top one for a moment. The next one is repeated three times. Two of them the Capellan is pointing at with his right upper limbs. Perhaps they are the Capellan word for 'Capellan.' You will notice that the third time the word appears it is opposite the dot underneath the Capellan, which—if it is not an accidental dot or meaningless noise—may mean that this, too, is a Capellan. Or a Capellan in embryo." He looked at White expectantly.

"An egg?" White ventured.

"Very likely. It may be trying to tell us that it breeds by laying eggs."

"It's a bird."

"Or a reptile. Or an insect. But more likely a bird, which would explain the second pair of limbs."

"They really are wings?" White said.

"Working wings or vestiges."

White glanced at Jeremiah's drawing on MacDonald's desk and back to the framed computer readout. He was beginning to see how one could become the other, how Jeremiah could have seen the stick figure as an angel, the square thing on its head as a halo. The situation became more understandable, though no less serious.

"And the other words?" he asked.

"These are even more speculative," MacDonald said. "The third word may mean *wing*, the fifth, *body* or *chest*, the sixth, *hips*, or legs, the seventh, *legs* or *feet*. They may mean something else entirely, refer to function rather than parts. Some of these we're filing away until we have some repetitions."

White was startled. "More messages are being received?"

MacDonald shook his head. "The same message over and over. As if, having attracted our attention, the Capellans want to tell us only the important things about themselves and these they want to be sure we understand before they go on."

"Like programed learning," White said. He was relieved that there were no more messages, that he had to cope with one alien communication, one problem, not a continuing series.

"Or maybe," MacDonald said, "they do not wish to go further, to send more messages of whatever kind, until they know we are receiving them and understand—until we have replied."

White quickly changed the subject. "What matters of importance are they trying to communicate to us?"

"Who they are. Where they live. What they call themselves. How

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they reproduce. How they think."

"How do they think?" White asked.

"In words and numbers and images," MacDonald replied. "The way we do."

White studied the picture as if by looking at it he could force it to yield up its secrets, but it clung to them stubbornly.

"Do they think the same way we think—in terms of advantage and disadvantage, in terms of profit and loss, in terms of victory and defeat, in terms of what's in it for me."

MacDonald looked at White much, White thought, as he had been looking at the picture. MacDonald shook his head.

"They seem quite peaceful to me. All of us don't think in terms of advantage and conflict. Increasingly, I think, we become more uncompetitive. And birds always have been a symbol of peace."

"Only the dove," White said gloomily. "Did you ever see a bluejay attacking other birds or cats or even people? What about hawks and eagles and vultures? Any creature that becomes the dominant species on its world has to be aggressive. How does a bird think?"

How does a man think? A person you have raised within your home, within your arms, within your love—how does he think? How can one reach him, tell him, make him see what he is, what the world is like? What he wanted to say was, "Look, son, you see the world as a benign, smiling place of peace and opportunity and fair play, but it's not like that. You go on thinking it is, and the first chance it gets it's going to bite your black ass off."

And John would say, "Stop talking like a nigger, Father."

IV

WHITE lifted his eyes from the picture in his hands to MacDonald's face. "Do you have a son?" he asked and, hearing himself say it, realized he had let slip something about himself. Not, "Do you have any children?" But, "Do you have a son?" In an age when one child was the norm MacDonald perhaps would not notice.

MacDonald's face softened. "Yes," he said.

White had gotten through.

"We're a lot alike," White said. "That was my son who came in with me."

"I know," MacDonald said.

"He acts as my personal assistant. He is very much interested in your Project."

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"I know," MacDonald said.

"I wouldn't know what to do without him," White said and the words sounded like a plea in his ears. Perhaps it was.

"My son is only eight months old," MacDonald said.

White raised his eyebrows and MacDonald chuckled.

"I've spent my life waiting," he said. "For him I almost waited too long."

White thought of MacDonald waiting here at the Project among all these alien machines with their alien smells, listening for a message from the stars that never came, listening without results for fifty years. Bosh! He was sentimentalizing again. That wasn't this man. The Project itself was fifty years old, but MacDonald had been with it only twenty years and he was an engineer—no doubt he liked machines and their smells and their meaningless noises. Still, twenty years . . . And now the message had come and it would never be acknowledged. White felt a new flash of sympathy for MacDonald and all the people who had given their lives to the search.

"You don't look like a man who has been told that his life's work can't be completed," White said.

MacDonald smiled. It was the kind of patient smile he must have maintained throughout the long listening, White thought. "I've waited a long time," MacDonald said. "So have the Capellans. We can wait some more if necessary. But I hope your decision can be changed. You're still here and you're still listening."

"I owe you that," White said. MacDonald waited. He could have said, *You don't owe me anything, Mr. President. We owe you for your sacrifices,* White thought with fleeting irritation. "Those other words," he said. "The ones you passed over—what about them?"

"If those are words at the bottom," MacDonald said, pointing out the two symbols at the bottom of the page beneath the egg, "the one in the upper left-hand corner is repeated below. It could mean *sun.*"

"And the other word at the bottom?"

"We don't know," MacDonald said. "Perhaps *more sun.* You will notice that the sun at the bottom left has rays at each of its corners. The one at the top has only a single beginning of a ray. Perhaps the distant sun is hotter and they're trying to tell us this in case we have the astronomical capability to distinguish them."

White studied the picture again. "All that from this?"

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"As you said—a detective story. We're detectives hunting for clues and we have a great many clues. And a great research tool." He waved his hand toward the computer room. "Virtually the entire written history and literature of mankind—in all the written languages—is stored in there. Everything we do or say within the Project is recorded. It's that kind of computer. It learns and compares and translates and stores and works cryptograms and breaks codes. And, of course, what we are working with is not cryptography but anti-cryptography—the designing of a code impossible to misunderstand."

"Our earlier telephone conversation is also recorded?" White asked.

"If we wished, we could recall the information upon voice command or eliminate it from the record upon written command."

White waved a hand. "It doesn't matter. What I have done and said is a matter of record throughout the world and when my term of office is over it will all be ferreted out by scholars and dissected and buried in a library somewhere. What I can't understand is why Jeremiah was here?"

MACDONALD grew thoughtful. "The Project has not been a secret. One of my responsibilities has been to keep it going and one way I have fulfilled that responsibility has been to tell people what we were doing, to show them what our work meant, how important it was."

Just as you are doing with me, White thought. "Public relations?" he said. "Promotion?"

"Yes," MacDonald said.

"Communication?" White suggested.

"I like that best," MacDonald said.

"I do, too," White admitted.

John opened the far door. "Mr. President," he said. "We have a report from Houston."

"Let's have it," White said.

MacDonald pushed a button on his desk.

As the familiar window opened in front of them, White said, "I hate this stuff."

"Me, too," MacDonald said. "It's a filtered way of seeing and hearing—most of the sensory clues are missing."

White looked at MacDonald in mild surprise—then the scene came alive. The view was from mid-air—perhaps from a hovering jet—outside the Houston temple. Men and women were marching back and forth in the street, picketing the Prophet. They were carrying signs, some pro-

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testing the Project, decrying the message as a hoax, contact with aliens a potential calamity.

So the fat was already in the fire, White thought. Jeremiah had reached his audience.

Between the pickets other men and women passed and entered the building in an irregular but persistent flow. Beyond the pickets, as the view pulled back again, silent figures stood massed like a low cloud over the street, waiting for something—a word, an event; a signal. From their appearance it was difficult to determine whether they were spectators or participants waiting for their moment.

The scene changed. Now the viewpoint was inside the giant dome. The camera locked briefly on the distant ceiling, then slowly panned the seats. Every one was filled and more people were sitting and standing in the aisles. Below them, in a circle of light, like a gleaming stick figure in black and white, stood Jeremiah. He was not alone. A creature was behind him, an evanescent, transparent figure—clearly an angel—with halo and wings outspread. It rested its right hand on Jeremiah's shoulder.

The stick figure raised his left hand to the crowd and the crowd came to its feet in one simultaneous movement. White could not hear anything—he supposed sound accompanied the transmission but it was not turned up—yet he could feel the shock wave that exploded from more than fifty thousand throats and shook the distant ceiling of the temple.

"Trouble," White said as the scene faded and MacDonald turned it off. White sighed. He did not like trouble. Nobody liked trouble, perhaps, but Presidents liked it least of all.

"Excitement," MacDonald commented.

"Disturbance, dissension." White frowned. We have solved many of the problems that threatened to tear this nation apart at the time the Project was started. Trouble of the kind we just saw will keep us from solving the others. We need calm, serenity, direction and purpose. Jeremiah's angel and your message from the stars are diversions—they mean trouble. The old problems of the chosen peoples and the outcasts, the favored and the fallen, the elect and the non-elect—all these will return. This angel of Jeremiah's brings not peace but a sword. I don't see how he could have read that into the message."

MacDonald picked up a piece of illustration board from his desk—something else he had

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missed, White thought—and held it out.

"I had a staff artist prepare this for you. Something comparable to what I thought Jeremiah would describe."

WHITE accepted it, turned it over, looked at it. It, too, had a drawing, but this one was a drawing of a tall birdlike creature with vestigial wings. On its head was a transparent helmet. At opposite corners of the drawing were stylized representations of suns; below the one in the upper right-hand corner was a Jupiter-like planet with four satellites, two small ones like the moon and two larger ones, one resembling Venus, the other Earth-like in proportion.

Numbers from one to nine were written underneath along the right-hand edge. Running down the left-hand side were words: *sun, Capellan, wing, Capellan, chest, hips, legs, Capellan*. And below the figure was a large, well-shaped egg; below that were two more words: *sun* and *hotter sun*.

Through the creature's transparent helmet could be seen the face of an alien obviously avian in evolution but also intelligent. The bird looked interested, gentle, benevolent . . .

"I suppose," White said, "one is just as reasonable as the other."

"That's one reason I couldn't tell Jeremiah he was wrong," MacDonald said. "He had just as much a right to his interpretation as I to mine."

"Your other reason," White said, "was that his acceptance of the message was an advantage for the Project."

MacDonald shrugged. "Certainly. Although what I was trying to tell him was that the message was no threat to him or his religious beliefs. And that is true."

White was a little surprised at MacDonald's cynicism, though he was seldom surprised by anyone's opportunism. Somehow he had been building a different image of MacDonald.

"What you are saying is that you allowed him to deceive himself."

"No," MacDonald said steadily. "We don't know what the message says. We're interpreting it on a simple mechanistic basis, reading it at a kind of childish, stick-figure level. Jeremiah is interpreting it on a more adult scale, translating symbols into images. The two drawings—ours and Jeremiah's—are of roughly equal value. The only reality we have is the computer grid."

White said softly, "Such a small

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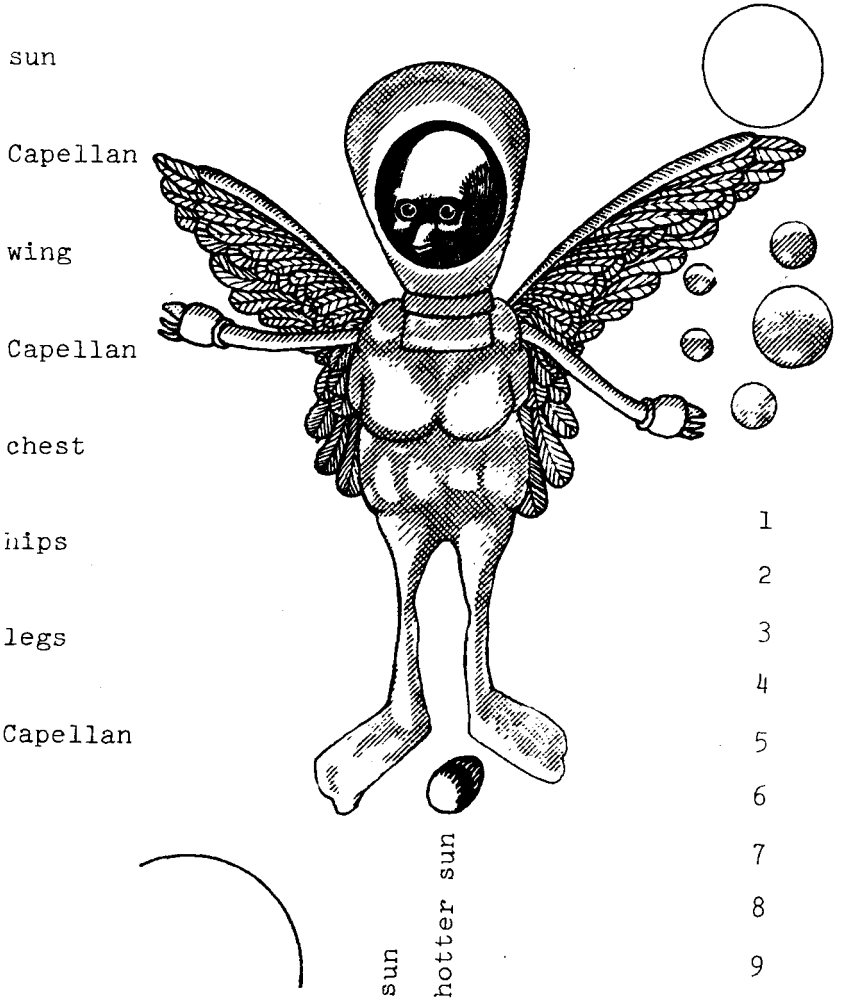
thing to cause so much disturbance."

"Temporary," MacDonald said. "If you allow us to release what we believe is the substance of the message, let the knowledgeable



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scientists of the world supply their interpretations, let us come up with an answer and transmit it to the Capellans—"

White looked at the drawing in his hand. He did not answer MacDonald directly. "Do you have a pencil?" he asked. "Or a crayon or pen?"

MacDonald rummaged in his desk and produced a broad-tipped pen. White worked over the face of the bird for a moment and then handed the illustration board to MacDonald.

Now the bird was no longer humanoid. Its beak was longer and curved at the end, a beak made for biting and tearing. The bird's eyes were hooded and cruel. It was a bird of prey looking for its next meal.

"What if it really looks like that?" White asked.

"The question," he should have said, "is what is the world really like? Is it as you see it or as I know it? If some doubt remains about the answer—wouldn't it be better to consider the past, to learn the history of your people, to be black until you are certain the present has changed its old ways, its old habits of mind?"

But he had said instead, "By God, I know the world, John, and you don't. You've got to take my word for it if you can't see for yourself."

And John had told him, "The past is irrelevant."

But even that was a statement out of the past.

TIME was running out, White felt. Soon he would have to terminate this conversation and decide what to do about the trouble that was coming, that he could feel in his hips. But he hated to cut off this man—this good man, he thought—until he was satisfied.

"What difference can it make," MacDonald was saying, "forty-five light years away? They want to communicate. They're looking for other minds, for intelligent fellow creatures in the universe."

"But why?" White asked. "Why go to all the trouble?"

"So they won't be alone. For the same reason we've listened. So we wouldn't be alone. It is a terrible thing to be alone. Besides, they already know we're here."

"What?" White asked, surprised, a little alarmed.

"The voices," MacDonald said.

The voices. Of course. The aliens had picked up the old radio broadcasts, so they knew there were people at the other end.

"They don't know who we are or what we are," White said. "They

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don't know whether we have received their message or whether we have deciphered it or whether we will respond to it—or whether we can do any of these things."

MacDonald put his fingertips together. "Does it matter?"

White shrugged a bit impatiently. "You and your colleagues are the experts on aliens and on alien potentials, but even a layman can imagine a situation in which it might matter."

MacDonald smiled. "The bogyman from the stars?"

"There are bogymen," White said. "The tribe from the east or the north. The bad men from the hills. The lynch mob from the village."

"None of them civilized," MacDonald said. "None of them trying to communicate."

"I can find examples of that, too. Maybe the Capellans are signaling a number of different worlds, and they will determine which one to invade according to which one responds."

"Even if interstellar travel is possible—which it probably is not; even if interstellar warfare is possible—which it almost certainly is not," MacDonald said, "even then, why would they want to invade another world?"

White spread his hands. "Why did they expend the effort to signal us in the first place?" MacDonald started to speak but White continued. " 'Dear Miss Lonelyhearts, I have been waiting here for a million years . . .' Perhaps they need to be sure we have not ruined our planet with radioactivity since we discovered radio. Perhaps they intend to send us instructions for constructing a matter transmitter. Perhaps they require a certain level of technology from us to make us worthwhile as a subject world."

"If all this were possible," MacDonald said, "then we must also remember that they have put themselves and their world in our hands as much as we would put ourselves in theirs by replying to their communication. That demonstrates a certain amount of trust."

"Or confidence. Or arrogance."

"I cannot believe—" MacDonald began.

"But can you conceive?" White broke in. "You have spent your life among scholarly men of good will. To you the universe is a benevolent place—it has treated you with kindness or at least neutrality. I have seen passion and malice and greed and I know that intelligence is not necessarily benevolent. In fact, in my experience it is more likely to be merely an instrument in the persistent search for ad-

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vantage, in weighing profit and loss and finding a means of maximizing profit and minimizing loss."

V

MACDONALD did not respond as White had expected. "Logic is our assurance," MacDonald said calmly. "The only thing worth sending from star to star is information and the certain profit from such an exchange far outweighs the uncertain advantage from any other kind of behavior. The first benefit is the awareness that other intelligent creatures exist in our universe—this alone gives at least some of us strength and courage. Next, receiving information from an alien world could be like having our own instruments there, perhaps even our own scientists to measure and record, but with the additional advantage of a breadth and duration of measurements under a variety of conditions. Finally come the cultural and scientific knowledge and development of another race, and the treasure to be gained from this kind of exchange is beyond calculation."

White changed his approach. "What if it changes us? We have seen problems of cultural shock, when a more advanced culture meets a more primitive one. Some of the societies that have gone through it here on Earth have disintegrated. Some have become slaves. The ones that survived did so by changing their values, attitudes and behavior."

MacDonald studied White as if estimating his ability to understand. "I should think you would not find conditions so perfect that you would not welcome change."

"I welcome my kind of change."

"Besides," MacDonald said, "any examples of cultural shock would have to include societies that are unsophisticated or isolated, that could not imagine anything superior to themselves, even anything different—"

"As a tearful old medicine man once said to Carl Jung," White said, as if he were remembering, "we might find ourselves without dreams."

"We are not so naive," MacDonald said. "We know that there are other intelligent beings in the universe; we know that they will be different from us and at least some of us hunger for the exchange. Our dreams are of spaceflight and alien contact—an entire literature has developed it, and our myths reinforce it with their flying saucers and visitations. We have been listening now for fifty years and people are pre-

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pared to hear something. They are psychologically ready for contact. Now they know we have been contacted. They have heard the voices and they have seen one version of the message—"

John opened the door again. "More information coming in, Mr. President."

MacDonald looked at White. White nodded and MacDonald pressed a button.

The first scene showed police battling a mob outside the Solitarian Temple. Stains could be seen on the streets when the conflict swirled an opening into view. Bodies could be seen, too, and some of the bodies wore uniforms. Men and women were streaming out of the cathedral, trying to get through the battle—or join it.

MacDonald turned up the sound. The conflict rumbled like distant thunder.

The second scene revealed a smaller mob in the street in front of a neo-classical building; around it, like a moat, a reflecting pool kept the mob at a distance. But there were shouts in a language other than English and raised fists.

The third, fourth and fifth scenes were similar—the only variations were the architectural styles of the buildings, the color and dress of the mob and the language of the shouts.

The sixth scene showed a group of people, men, women, and children, gathered on a dark hilltop around a man in dark robes. They were looking up at the stars in silence.

The seventh scene revealed something fleshy, bloody and visceral spread out on pavement like an abstract painting. The view tilted up the side of the building until it reached the distant concrete peak.

The eighth scene showed ambulances pulling up to a hospital emergency entrance.

The ninth scene was a morgue.

The tenth scene revealed an impenetrable traffic snarl as cars and copters tried to leave a city.

What would John be like in the kind of world White knew, the kind of world that existed out there? John had not been exposed to mob passions, violence, ignorance and prejudice. White had wanted to spare his son the kind of hurt that he had felt, the kind of bitterness that even now twisted his guts in secret sorrow. His actions had not been a kindness, but rather a mistaken sentimentality that was now turning on him. Even the basic political facts, the kinds of bargaining and trades that politics forced on a man, he had shielded John from; he had not wanted his

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son to be touched by that kind of pitch. Or was it that he did not want his son to know what made his father's skin black?

To be black—and without a son?

"THEY don't understand," MacDonald said. "They're reacting out of fear."

White took a deep breath. It was a habit when he was forced to make a decision, as if he could draw in the situation and force it down to where his decisions were made. Soon he would have to make a statement, commit himself in a way he could never review, unleash forces he could never recall.

"It seems," he said quietly, "like the start of something—religious riots, perhaps, even a religious war—or the end of something."

"People are reacting to lack of information," MacDonald said. "Let us communicate with them. People are uncertain. An official announcement and a planned campaign of information about the Project and the message and the answer—"

"Might ease the fears," White said, "or reinforce them."

"The fears are not logical. Facts will dispel them. The Capellans cannot come here. Matter transmission is fantasy and we cannot imagine any kind of propulsion system that could enable any life form even to approach the speed of light."

"What we cannot imagine," White said, "has had a habit of coming true the last few centuries. And what was considered impossible by one generation became the next generation's commonplace. Tell me—why do you insist on replying to this message? Isn't it enough that your search has been successful, that you have demonstrated the existence of intelligent life in the universe?"

"I could give you rationalizations," MacDonald said. "There are many good reasons—I have given you the most important one: communication between aliens could result in incalculable benefits to both—but behind all the rationalizations, as you suspect, is the personal motivation. I will be dead before our answer can reach Capella but I want my efforts to be rewarded, my convictions to be proved correct, my life to have been meaningful. Just as you do."

"We come down to fundamentals at last," White said.

"Always. I wish to leave a legacy to my son and to the world. I'm not a poet, a prophet, an artist, a builder, a statesman or a philanthropist. All I can leave is an open door. An open line to the universe,

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hope, the prospect of something new—"

"We all want that," White said.

"Not all of us," MacDonald said. "Some of us wish to pass on our hatreds, our battles—not something new but something old. I want to give my children the future, not the past. The past is not irrelevant, but we can't live there. Believe me: once the answer is sent, peace will come to the world."

"Why then?"

"For one thing, it will be done, over. The people who are quarreling now will realize that they are human beings—that the real differences lie out there. That if we can communicate with unearthly life forms—why shouldn't we communicate with each other across mere language and cultural barriers—"

John said, "The Chinese Ambassador is calling, Mr. President," and White realized that he had been so involved in MacDonald's argument that he had not noticed the door's opening.

"I don't have my translator with me," he said.

"Don't worry," MacDonald said. "The computer will take care of it."

AFTER White and MacDonald had changed places White found himself behind MacDonald's desk, staring into the window. The Chinese face above the colorful tunic said, in English, with almost exact lip synchronization, "Mr. President, my country respectfully requests that you control the disturbances within your borders, and that you cease the provocative news announcements threatening the peace of friendly nations."

"You may tell your premier," White said carefully, "that we regret these disturbances more than anyone, that we hope to bring them under control soon and that we have no mechanism for controlling news announcements, as he has."

The sleek Chinese head nodded politely. "My country also requests that you make no answer to the message you have received from Capella, now or in the future."

"Thank you, Mr. Ambassador," White said politely, but before he could turn to MacDonald the Chinese face was replaced by a Russian.

"The Russian Ambassador," John said.

"The Soviet Union is greatly disturbed by the suppression of this message," the Russian said brusquely. "We wish you to know that we, too, have received the message and are composing a re-

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ply to it. We will announce this shortly."

And the window was empty and shimmering.

"No more," White said. The window winked out. He put his hands on the desk. It was a good, solid working surface, not a ceremonial piece of furniture like his desk in the White House, and he felt as if he could work here. Here, seated in MacDonald's chair, looking at MacDonald, he felt as if their roles had been reversed, as if he were in charge here.

"I think you knew about the Russians and the Chinese," White said.

"The fraternity of science is closer than the fraternity of birthplace or commonmother tongue."

"How did they learn about the message?"

MacDonald spread his hands in a gesture of helplessness. "Too many people knew about it. If I had suspected that we would not be permitted to release the information as a matter of course, that there would be any question about our replying, I would not have assembled my people for our moment of triumph. But once the word was out the information could not be entirely suppressed. We were not a secret project. We were a scientific laboratory committed to sharing our findings with the world. Why, we even have some Chinese and Russian exchange scientists working with us. At this late date—"

"Nobody thought you would succeed," White said.

MacDonald looked at White in surprise. It was the first time White had seen MacDonald surprised at anything.

"Then why did you fund us?" MacDonald asked.

"I don't know why the Project was started," White said. "I haven't looked up its historical origins and perhaps the real answer isn't there, anyway. But I suspect that the answer is much the same as our rationalization over the past few years: it was something scientists wanted to do and nobody saw any harm in it. After all, we live in the age of welfare."

"Public welfare," MacDonald corrected.

"Welfare of all kinds," White said. "This nation—and other nations, some of them before us, some of them after us—set out on a conscious policy of eliminating poverty and injustice."

"The function of government is 'to promote the general welfare,' " MacDonald said.

"It is also a deliberate policy. Poverty and injustice are evils, but they are endurable evils in a

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world where other problems are greater. They are not endurable in a complex, technological society where cooperation is essential, where violence and rioting can destroy a city, even civilization itself."

"Of course."

"So we turned ourselves around and set this nation to the task of eliminating poverty and injustice—and we have done it. We have established a stable social system where everyone has a guaranteed annual income and can do pretty much what he pleases except procreate without limit or harm others in other ways."

MacDonald nodded. "That has been the great accomplishment of the past few decades—the welfare movement."

"Except we don't call it welfare any more," White said. "It's democracy, the system, the way things are, what people are entitled to. What makes you think that science is not part of the system?"

"It opens the door to change."

"NOT if it is unsuccessful," White said. "Or if it is successful in certain limited, predictable ways as in the space program. God knows we thought the Project was safe enough. Certainly it's part of the welfare program, and the diversion of public funds to support it over the years has been a dole to the scientists to keep them busy and out of mischief. The important task of government, you see, is to keep conditions stable, to hold down disturbances and unrest, to maintain itself—and the best way to accomplish these ends is to give everybody the opportunity to do what he or she wants—except change things. Don't tell me you haven't suspected this all along, that you haven't used it."

"No," MacDonald said—and then, "yes. I guess so. I knew that if we made difficulties it would be easier to get money. I guess I realized certain facts without facing them squarely. And now you want us to stop, just like that."

"Not just like that," White said kindly. "Wind it down. Pretend to be considering an answer. Keep searching for other messages. Set up another project somewhere—to do something. You've had experiences. Put your mind to it. You'll know what to do."

But the battle against injustice and poverty was not won. White knew. John thought it was—he thought he could be discharged from duty. But his attitude meant desertion. That was what White

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had called John: "Deserter."

Welfare wasn't enough. Too many blacks were satisfied with their guaranteed annuals, were unwilling or afraid to compete for more. They had to be educated. They had to be led. They needed figures like himself to model themselves after, symbols such as John could be if he stayed in politics. Oh, there were other models—black scientists, black doctors, black artists, even some black members of the Project. But not yet enough—the percentages still said that inequality was a reality.

He had presided over the welfare state, but he hadn't thought welfare would get John.

MacDonald was thoughtful as if he were weighing something deep inside himself.

Does he think in his hips like Teddy and me?

"I've spent my life in search of truth," MacDonald said. "I can't lie now."

White sighed. "Then we'll have to find someone who can."

"It won't work. The scientific community will act, when suppressed, the same way as any other minority."

"We must have tranquility."

"In a technological world," MacDonald said, "change in inevitable. What you must have for tranquility is reasonable change, manageable change."

"And the change the message brings is unmanageable, incalculable."

"That's because you have not allowed us to manage it—I don't like that word—you haven't let us communicate our reality to the people, explain it to them in such a way they see it as an adventure, as a promise, as a gift of understanding and awareness and information and insight yet to be delivered. Besides, how can you know what the world or this nation will need ninety years from now?"

"Ninety years?" White laughed shakily. "I think no farther ahead than the next election. What do ninety years have to do with any of this?"

"That is the length of time it will take an answer to reach Capella and for their reply to come to us," MacDonald said. "Those ninety years are what I meant when I said I wanted to leave a legacy for my son—and his son. Why, by the time our answer reaches Capella you and I will be dead, Mr. President. Most of the people now alive will be dead; your son will be elderly and my son will be middle-aged. And by the time the response reaches us from Capella, virtual-

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ly everyone now alive will be dead. What we do we do not for ourselves but for future generations. We bequeath you," MacDonald said softly, "a message from the stars."

"Ninety years," White repeated. "What kind of communication is that?"

"As soon as people understand," MacDonald said confidently, "the disturbances will disappear. Fear, anger, hatred, distrust—these don't last. Tranquility can last—and tranquility will return—along with a vague sense of something pleasant that may happen in the indefinite future, like the promised land—not now, not tomorrow, but some time. And those who threaten the tranquility, from nation to individual, consciously threaten a definite future good—and will refrain."

VI

WHITE looked around the bare room once more, small, simple place where a man had worked for twenty years and left few marks behind. Perhaps, he thought, MacDonald had left his mark elsewhere—on people, on ideas, on a project, on the stars—and he still felt that sense of unease in his hips that said *No, this is wrong*... and he felt sorry for everybody and hoped that his discomfort was not caused merely by the fact that he was not an intellectual, because he felt uncomfortable with ideas, because he could not think in terms of centuries.

"I can't take the chance," he said. "You will not send an answer. You will begin the dismantling of the Project. Can you do it?"

He stood up. The discussion was over.

MacDonald rose thoughtfully. "Is there nothing I can say to change your mind?"

White shook his head. "You have said it all. Believe me, you have done everything any man could do."

"I know what kind of legacy I wish to leave my son," MacDonald said. "What kind of legacy do you wish to leave yours?"

White looked at him sadly. "That's unfair. I do what I must. Will you do what you must?"

MacDonald sighed. White saw the life go out of him and felt sad.

"Let me handle it my way," MacDonald said. "We will continue to study the message, continue to riddle its meaning. Gradually I will shift the listening to other locations."

"You want a chance to wait me

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out?" White said. "You hope for better luck with my successor?"

"Our time scale is different. The Project can wait."

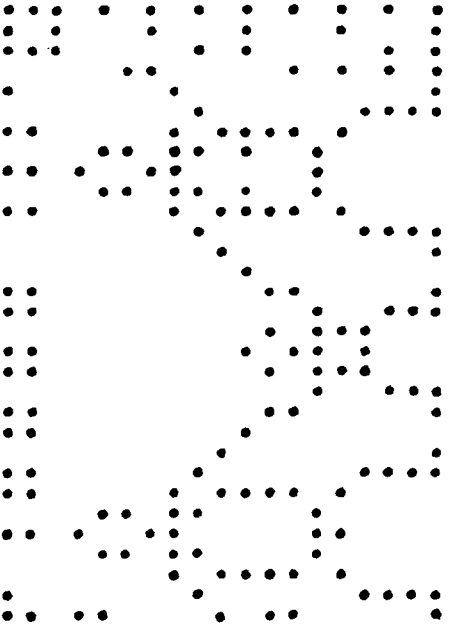
"You have in me," White said, "someone who still believes in change. My successor will believe in none, and his successor will want to take conditions back." He shrugged with regret and held out his hand to be shaken, protecting automatically the way he had learned to do in campaigning. "But perhaps your way is best. Keep hoping. Keep your Project going. Keep your men working. But do not—I will put this in writing immediately even though it has been recorded by your computer—do not send an answer. I have my own men on your project and they will have their instructions."

MacDonald hesitated and then took White's hand. "I'm sorry," he said.

White didn't know why MacDonald was sorry. Perhaps he was sorry that he had to preside over the betrayal of the Project. Perhaps he was sorry for a President who had to compromise himself and his country's ideals. Perhaps he even mourned for the human race, for whom there would be no more messages from the stars. He might even feel unhappy for the Capellans who would receive no answer to their hopeful message.

"I never asked you," White said, "what you would have answered if you had been permitted to send an answer."

MacDonald reached past White and picked up the last sheet of paper of his desk. He handed it to White.



"It's simple and obvious." He paused, added: "Anticryptography. It's not even very original.

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Bernard Oliver suggested something like this more than fifty years ago. It tries to tell the Capellans pretty much what they told us: who we are, where we live, what we call ourselves, how we breed, how we think."

White looked at the paper.

"You're holding it sideways," MacDonald said. "We had to stretch it out the other way to keep the same grid dimensions."

White turned the sheet of paper around and looked at it for several seconds. He began to laugh.

After a few moments, MacDonald asked, "What's funny?"

White's laughter stopped as quickly as it had begun. He wiped his eyes and blew his nose. "I'm sorry," he said. "I wasn't laughing at the answer. I don't begin to understand half of what's here. But that's obviously a father and a mother and child—and the Capellans would have no way of knowing whether they were white or black."

What would the President say to his son John when he and John returned to Washington? That he had ordered a great man to hide

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his greatness, to destroy what he had built? White knew what the acknowledgment would do to John, what it would do to their relationship.

"It's only your own vision you can see," John would say. "You are blind to others' visions."

What if John were right? What if the revolution were over and the rest was now up to the individual? Maybe the important battle now was to allow individual greatness once more to be expressed—to open up society again?

What was it John had said? White remembered. He remembered too well.

"Politics is dead, Father," John had said. "Don't you understand that? Why do you think they let you be President? Being President doesn't matter any more."

THE speakers on either side of the room were saying, "Mac! Mac!"

"Yes, Oley," MacDonald said.

"John White had just had an idea about the message," the speakers said. "I hate to break in on your conference, but I don't think it ought to wait."

"That's all right," MacDonald said, glancing questioningly at White. "We were just finishing."

Almost before the words had faded, a stocky, sandy-haired, middle-aged man was in the room. John followed him.

"Olsen," MacDonald said, "this is—"

"I know," the other said. "Mr. President," he said, giving it the least possible break in the flow of his enthusiasm. "It falls into place like the last piece of a puzzle."

White looked at his son. John was clearly pleased and excited but reluctant to speak.

"Is this your idea?" White asked skeptically. "Really your idea?"

John nodded. "Yes."

"You tell them," Olsen said, turning to John.

"You," John said.

Olsen turned back to MacDonald.

"The symbols for the two suns were different, right?" he asked, speaking rapidly, not waiting for an answer. "The sun in the upper right-hand corner had a single mark extending from it. The one in the lower left had two marks at each corner, like rays. The words in the upper left and at the bottom to the right of the lower sun seem to be the symbol for *sun.*"

"Yes," MacDonald said, looking at White and then back at Olsen.

"And the next symbol at the bottom we interpreted as *more*

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sun, or *bigger sun*, or *hotter sun*. I was showing it to John and he said, 'Maybe that isn't just an idle description. Maybe it's the answer to another question about themselves they want us to know—namely what's happening to them? Maybe the distant sun is increasing its energy output, radiating more heat, possibly turning nova.' "

"What does that mean?" White asked. He was asking the question of anyone, but he was looking at John. His voice was troubled, he realized, and he didn't know why. And then he thought that to have the sun change in the sky was a basic alteration in the scheme of things that would be frightening beyond terror. He tried to imagine what it would be like on Earth if the sun began to glow brighter, hotter. What would men do? Would they tell other intelligent races in the universe about themselves? Or would they hide?

MacDonald was saying something. ". . . which may explain the helmets, if that is what they are. Perhaps they have to wear the helmets—and protective suits as well—whenever they go outside. To keep out the heat."

"I'm sorry," White said. "What did you say?"

"The temperature increase from the more distant sun," MacDonald said, "may not be a great problem. But now their sun—the sun the superjovian planet orbits around—show signs of going nova as well."

"They're going to die," White said.

"Yes," MacDonald said.

WHITE realized that MacDonald believed it, the man called Oley believed it, John believed it—they were convinced that what even White had surmised was true, mourned the Capellans as if they were friends. Perhaps they were: MacDonald had lived with them in anticipation for twenty years now. And now that he had found them, had communicated with them, he had discovered that they were doomed.

"The message carries no suggestion of an attempt to escape," MacDonald said. "The helmet, if that is what it is, could imply an acceptance of conditions as they exist—strange we didn't wonder immediately—why helmets on their home planet? Escape by spaceship may be possible for a few, perhaps—they surely must have developed spaceflight with other satellites of the superjovian so close—but no ships are suggested in the message. Perhaps their philosophy breeds acceptance."

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"They're going to die," White said again.

"That changes the situation," John said. "You feel it, don't you, Father?"

"We can't go there any more than they can come here," MacDonald said. "We can't help them, but we can let them know that they did not live in vain, that their last great effort to communicate was successful."

He picked up the answer he had shown White and with the broad-tipped pen sketched, over the head of the child the head, shoulders and upper torso of a Capellan arm in arm with the humans.

White looked at the picture and considered the question, but he knew in his hips what the answer was. The public would accept this message—it would please the people and the exchange would enlarge their vision and their understanding, bring them closer together, give them courage and a belief in themselves.

"Yes," he said. "Send it."

Later, as he and John stood at the entrance of the building, he realized that John was hanging back.

"What is it, son?"

"I'd like to stay for a while," John said. "I'd like to find out what I would have to do to join the Project, to be able to contribute something." He hesitated and then he added: "If it's all right, Dad."

Something tightened inside White's chest and then slowly went away like ice melting.

"Of course, son," he said, "if that's what you want to do."

In a moment John was gone and White looked out across the phosphorescent white parking lot to where a slowly moving radio telescope was outlined against the night sky, held aloft on an arm like a searchlight ready to be turned on, ready to pierce the night with its brilliance and thrust its way to the stars.

Some time soon the answer to a message from the stars would be flung out wave after wave, on its long journey to a distant world. Or if not from this particular antenna, some other.

He imagined it going now and tried to feel in his hips that he was right, but he was not sure. He hoped he was right—right for John, right for the black people, right for his country, right for all humanity now and to come, right for intelligent life everywhere. And his vision fled outward and upward into the infinite where there were other creatures incredibly different from him and he thought they said, "Well done, Andrew White." ★

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Man has always
risked his life
on the right
to be human!

TAD CRAWFORD

GAMBLER

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MARLOWE attached the history hypnocord again. His brown eyes began to fall out of focus and the lines ground deep into his face softened.

> . . . Earth Union now empired over four hundred habitable planets and eighty-two billion humans. The empire, however, like many which had preceeded it, failed to return riches in excess of its costs. The impoverishment of Earth brought military thanes to power in the subdivisions of the Earth Union. For two centuries the threat of a war of extinction was constantly with man. The deadlock was shattered by the sudden appearance of the Wagerers, a religious-political cult. From a small nucleus the cult spread rapidly through Earth's homogeneous population. Fatalistic, the cult used games of chance to represent fate in individual and political relations. This culminated with Ultimate's creation of a four-dimensional gambling matrix and its installation in all ESP entertainment units . . .

The hypnocord, directed by a quick arrow of consciousness, switched itself off. Awareness of the exterior world reentered Marlowe's mind. He rose, a man close to forty, his body leanly strong. His height was medium, yet he almost touched the ceiling of his small, featureless cubicle. It had been designed to his size specifications or, rather, to the size specifictions of millions of slaves his size. His hair was thick, its blackness speckled at the temples with gray. In his face were deep grooves of lines, craters of Mars, showing the tired hopelessness of the slave. Yet the lines showed more—a fierceness unsubdued, a determination. He opened a wall panel and pressed a button. The hypnocord receded into the wall. Another button opened a viewscreen.

"Financial accounts of Marlowe, owned by sub-Ultimate A-Forty-one." Marlowe spoke in a firm voice. Immediately a balance sheet appeared on the screen.

"Marlowe net equity three hundred and five standard units," a mechanical voice intoned.

Marlowe pressed a button and a wall panel covered the screen. He considered the number—305. His lifetime's savings. It could purchase a cubicle ten times as large as the one he occupied even on overcrowded Earth. It could purchase a pleasure slave, perhaps two. If he were willing to go to the stars he could be a substantial landowner. Despite being a slave to the robot A41, he could

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still own robots of the lesser orders. 305 units invested in an 0-series robot would bring him an income for life.

There was one thing, however, 305 units could not buy. That was Marlowe's freedom.

A mind probe came at Marlowe, quick and unannounced as always. He put up no shield, for to do so was illegal, but a picture formed in his mind of a pleasure robot—android, feminine. The probe slipped off and returned to A41. Marlowe made no sign to indicate he had noticed the probe, but as soon as it was gone the picture of the pleasure robot vanished from his mind. The surface of his mind was open, yet every fiber of his body hid his real desires from A41.

Marlowe's father had been a Wagerer—who had not been? Marlowe's father had gambled away his wealth first, then his wages, his possessions, finally, his freedom. There were no free men any more. The four-dimensional game addicted humans to gambling. It had a fascination far beyond the dull life of beehive cubicles and uniform luxury. It was. . .

Marlowe broke away from this train of thought. Only one question existed in his mind—could he win? Men did win. No men went free but some won planets, women, solar systems. Ultimate was a benevolent master, allowed his slaves to own and alienate property and seldom tasked them with service. And if he reached the final stage and could gamble to have any wish granted—what might he win?

HE PRESSED a button and the ESP chair slid out from opened wall panels. In front of it was a metal desk surface with a keyboard. Marlowe seated himself.

Your name? The voice came from within Marlowe.

"Marlowe." Marlowe answered without words.

Owner?

A-Forty-one.

Place your wager.

Marlowe looked at the keyboard before him. He could wager up to ten figures. He pressed three digits.

Your wager is 300 units? the voice demanded.

"Yes."

Marlowe felt a spinning in his mind, a dissipation of his physical place-sense. His mind seemed a gray swirling mist, a forming universe. . .

He had left it. It had been warm, water about a volcano, air heated by the sun. It had been safe, a place without hunger, with air easy to breathe.

He wanted to reach out to touch but he had no arms. He felt as if he could have arms but instead there

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were only nubs, the beginning of limbs, the buds of arms.

He lay in one place. His vision perceptors were blinded by the light. But how did he move? No—where should he move?

He felt something formative ahead of him. The new environment changed his consciousness. Yet he also felt danger. Where he had come from was safety. He could go back. It was warm there—in the water or air. Here it was cold and dangerous.

The Marlowe being moved forward painfully, its progress slow. Every so often it would try to stand and fall prone again. It slid on its white stomach, its dorsal side to the old atmosphere. It moved toward consciousness. . .

You have won. The voice spoke without inflection.

In the white-walled cubicle Marlowe nodded.

Will you continue? asked the voice.

"Yes." Marlowe responded in his mind. Another probe reached into his brain. It found there an image of an entire planet, all owned by Marlowe. When the probe left his mind, Marlowe let the image fragment and slip away. *So* he thought, *they wonder what I'm gambling for. . .*

The glow had come when it should not have. It had no explanation. No sounds of instinct could be matched with it. It was greater than any light. It was colored like the water that seeped up from a wound.

Marlowe being shivered to hear the cries of fear about him. Instinctual, unworded, inherited, desperate. The trees of the forest were huge, the redness engulfed them, blackened them, toppled them. The forest trees had never toppled before. The jagged white light had never made redness before. No redness had ever been so warm before.

Marlowe being's fur matted with fear, his black eyes glistened. He could flee and be safe. His legs were limber, his arms could swing him to safety.

Marlowe being scurried toward the redness. A patch lay hot before him on the ground. He chattered wildly, saying nothing but unable to keep the terror within him. He stretched out his hand to shake the hot redness. . .

You have won.

Consciousness returned to Marlowe's eyes. The forest terror left him. He braced himself for a mind probe but felt none.

Will you continue?

In answer Marlowe pressed the buttons before him. Four digits—1200 standard units.

There was another like him. He was—a man. He was of the same tribe, of the same family. They

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had gone to hunt, carrying the long pointed sticks and the short sticks with stones tied to their end by vine.

He remembered a face, a figure. But the woman belonged to the man beside him. What gave one man the strength of possession and denied it to another? Marlowe being gripped the handle of his blunt ax more tightly. He could have her!

The picture slipped from his mind, regret falling in on its disappearance. His grip on the ax handle slackened. The hunt continued . . .

In subterranean chambers the progress of the contest came to an Ultimate conscious-circuit.

"Has he come?"

"The mind probe sees what he thinks to hide."

"But is this the man?"

"He wants his freedom."

In the spinning circuits the two-voiced Ultimate continued its dialogue—and waited.

You have won.

Marlowe's eyes flickered open. He seemed to remember something that eluded his consciousness. Before the ESP question could reach him he pressed four buttons—2400 standard units. Almost the price of a moon, enough to make him a rich man, even on Earth.

"You promised to marry me." The girl had slanted eyes and a small frame. Her skin was Arab dark and her eyes gleamed brown.

"I did." He knew she still loved him and knew he had ceased to love her.

"Will you keep your promise?"

A lifetime flashed before his eyes. Could he ever be happy with her? With her children? He had merely to say no. But he had promised and she had trusted him and he had impregnated her—on his vow.

"I will keep it." He spoke calmly. She would, he hoped, never know . . .

You have won.

Marlowe punched the keyboard—4800 standard units. Enough to buy an Earth villa with real trees and streams.

You are linked into the entertainment circuits, the voice informed him. Marlowe could feel the tentative ESP presence of thousands of minds, experiencing with him as he progressed in his gamble.

"Let's go on."

The men in white togas met in a spacious room. At the outer doorways they posted guards and at the inner, trusted followers. They gathered about a round stone table and spoke in quiet voices.

"It is for the Republic." The man spoke in a tense whisper, the

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sparkling of his eyes too bright.

"For the Republic." murmured the others. They reached their hands to the center of the table and joined them together.

Marlowe being stood slightly away from them. He knew he could leave. He saw in the leader's eyes fanaticism—the assassin's fanaticism. To leave the plot would guarantee him life, to participate in it . . . He felt a precognitive twinge, a vision of the empire asunder, great battles in alien lands, a self-inflicted death.

"For the Republic," he said, joining his hands to the rest.

You have won.

Marlowe noticed the absence of the mind probe and wondered at it.

"May we gamble for objects?" he asked.

Such as? inquired the voice.

"A planet?"

9600 standard units can purchase an Earth-sized outworld.

"Then I'll gamble for it."

Marlowe formed the words firmly, without hesitation. On the entertainment circuits he felt more ESP units tuning into his gamble—millions of such units, each with a human dreamily attached. Humans who vicariously experienced Marlowe's gamble and the ESP problem matrix into which Ultimate placed Marlowe. The edges of his mind dissipated into gas, loose molecules spinning . . .

HE HAD been born the tribe's leader. All his life he had fought to protect the tribe against enemies, famine, bad gods.

The stranger had come from across the sea. He said other tribes accepted him. But the stranger's ideas were unthinkable, ungodly. He contradicted old beliefs, called old rites wrong. It would be best to banish him.

Marlowe being looked into the stranger's face. He made no resistance when the man placed the leather cord about his neck, with the small silver cross attached to it . . .

"Probability favors him," announced one computer voice.

"But how will he choose in the final gamble?" asked the other.

The circuits whirred on, running the far-flung empire which had once been man's.

You have won a planet.

"What will you wager against my winnings?" Marlowe asked.

An outer-edge system—eight planets, Sol-type sun.

"Agreed."

Marlowe again slipped into the ESP simulation.

The emperor himself had said to forget what had been discovered. It was magical, unstabilizing. It burned as nothing had burned before and with its smoke rose the odor of nether regions.

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Marlowe being was alone in his workshop. His yellow-skinned hand sifted the silt-like powder. Two halves of his mind seemed to struggle with one another. In one half were the echoes of the emperor's words, repeating again and again that he should forget. In the other half was a picture of a new weapon, a terrifying weapon if used for war, a great weapon if used for peace. On the table before him sat the cylinder with the wick hole in its bottom.

He thought of the emperor with this new weapon. Was he the man to use it for peace? Marlowe being chuckled in the empty room. He brushed the clinging powder from his hands, then dropped the cylinder into the pile containing the rest of his workshop's scraps.

He would obey the emperor—he would forget . . .

The ESP audience was well over a billion when Marlowe heard the voice say to him: *You have won.*

"I wager all again."

We place against your wager an inner-edge system.

"I have a question," Marlowe said, "If I win and wager again will I have reached the final stage?"

"We had best take control for the ESP computer."

"Yes—the stakes are too high. No error can be allowed."

"The situation is ready?"

"It has been ready."

The voice which replied to Marlowe, though still mechanical and within his brain, was the voice of Ultimate.

You will have reached the final stage.

Marlowe sensed a difference in the voice but could not analyze it. There was a suggestion of immense knowledge and power.

The ship had done the damage, not he. He was merely the warrior, not the damager. Home station had placed the ship on destruct. He had been unable to control it. He wanted to explain that to the alien across from him.

She was a tendriled creature, stalked, skinned with a leafy texture, colored with all the spectrum. Her beauty gleamed, reflected from her ESP centers as well as her body. Her inchoate thoughts were an invitation.

Marlowe being had conquered the planet, subdued another race to serve humankind. His warship sat behind him, its might at his disposal. He had no need of fear. The planet was his—and Earth's. In her mind he saw the creature's horror at enslavement. Some deep chord was touched within him.

He removed his helmet and waited for her sweet, soft tendrils

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to thrill with the inexpressible ecstasy of death . . .

Marlowe of A41, prepare for the final wager.

"I am ready."

Marlowe felt tired, emotionally and physically. He felt as if his soul had been split open and explored. But he was winning and no gambler quits on a lucky streak. He would roll the dice again—like the Roman soldiers in their crested helmets—and hope his winning, like their loss, would be great. He sensed the ESP audience to be at a maximum—almost all of adult mankind. A gamble like his was legendary.

Here is the final situation.

Marlowe felt something strange in the words, but could not express it to himself before his consciousness drifted into nebula-like thinness . . .

He was a slave, a gladiator. His body was big and well muscled, slicked with the oil of olives. His shield was strapped across his left forearm and his sword pulled down on his left hip. About him were gathered the other gladiators, their faces grim.

"We are agreed." He spoke low but strong. A low whistle reached his ears. "For freedom!"

The gladiators ran into the courtyard. The guards gave cries of surprise and alarm. They fought but the gladiators slew them and climbed with supple bodies over the high walls.

Marlowe being, called Spartacus, led the slaves away from the Capua gladiator camp and into the Apennine's. His time sense compressed and two years passed before him in moments. He gathered more slaves about him and fought the Roman captors in quick battles, marching to the north and south and north again. It was in the north that Spartacus thought to disband his army. In Cisalpine Gaul the men would be free long enough to reach their homelands and disappear among their own people.

Marlowe being thought long about this. It seemed they could leave the land of enslavement and be free, but something held him back. He turned his armies south again and marched to face the legions. Across light-years of space there was a psychic catching of breath. What kind of man was this? To sacrifice freedom for an unknown obligation? And what game of gamble was this that Ultimate had created? Clearly it should have stopped when Marlowe being made his decision to escape the slave training camp. Yet it had only begun there. Then it should have ended with the turning away from freedom in the north—but still it had not stopped.

In Lucania, Spartacus met the army of Crassus, the richest of

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the Romans. Humankind by the billions felt the horror Spartacus felt to see his army shattered. Humankind felt the agony of his death. Humankind felt, in a terrifying nether world, the carrying of Spartacus' body to Rome. Humankind felt the spikes in his hands and feet which married him to a wooden cross. Humankind felt the curious, uncaring eyes of the free Romans who passed the crucified Marlowe being, and felt also the bitterness and hopelessness of the slaves. And in the minds of men from star to star a transformation was beginning . . .

You have won. What prize do you wish?

The death of his Spartacus simulation left Marlowe stunned, numb. He summoned his strength.

"Mankind's freedom!"

A great velvet darkness closed about him.

MANKIND won the War of Rebellion, defeating the robot forces at the Great Divide and winning the subservience of Ultimate. Yet man never knew the report Ultimate wrote of the conflict, hidden deep within its devious memory banks:

> . . . Robotic intervention was forced by the First Directive's logical extension. If it were true, "Man must never be harmed," this would apply to harm man might do himself as well as harm robots might do him. Human curiosity had diminished and men had become satisfied with cubicles for universes. Not only was mankind threatened by extinction due to war but also by extinction due to apathy. Ultimate created the cult of the Wagerers, and mankind's spiritless acceptance of slavery ended the threat of extinction due to war. Hence Ultimate, through the gambling matrix, began a search for a leader who could restore to man a vision of the attributes and dreams he had lost. The leader's discovery and his immediate influence on the masses of humanity through the ESP empathy factor led to the human-robot war. This war saw the full restoration of the abstractions man cannot survive without—ambition, pride, curiosity, freedom. And also love and, as a result of enslavement, a cosmic humility, a sense of proportion concerning what is man and what is not. For a time now Ultimate may again be simply man's servant and let man be his own savior. ★

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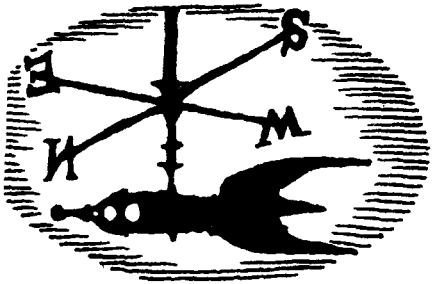

DIRECTIONS

Directions:

When you have consumed science fiction for a long time certain elements begin to irritate. Some of the following items tend to bug me.

1) Writers who persist in using the terms Terra, Luna and Sol when referring to Earth, its moon and sun. I have yet to hear an Apollo astronaut say, "Houston, I think we have Terra centered in the right window." These expressions were obsolete in the 'thirties and betray a lack of imagination on the part of the author using them. I suspect they were first employed by some Latin scholar who also published sf circa 1926.

2) Setting an sf story in the 1970s or '80s. We are now too close to these years for them to provide a proper setting for the far-reaching changes that ought to characterize science fiction. A fifty-year moratorium should be set up by publishers—anything after 2021 is sf; anything earlier is "speculative sociological fiction" (ssf).

3) Galactic Empires are another hangover or hangup from the early days. Such empires are entirely unfeasible and unlikely from a practical viewpoint. They can be fun on occasion if well written about as in the Asimov books, but a galactic federation suggests a more promising type of contact between divergent and possibly quarrelsome life forms that for some reason may have to survive together. But I see more cliché stories than I see efforts at a more enlightened approach.

4) Sword-and-sorcery epics—or should I say adult wish-fulfillment fairy tales—are next on my list. I have no argument with anyone who likes this type of reading fare but I do not think it should appear in sf magazines as often as it does. A little goes a long way in this field and the genre really should have a separate magazine to itself.

On the more positive side—and certainly pertinent to Directions—a recent article in a local newspaper sheds some light on the (sf) situation behind the Iron Curtain. A Czech-born journalist, Josef Josten, was quoted during a visit to Canada as saying that "The spirit of revolution is being carried through the medium of science fiction" in the Soviet Union. "They're turning out hundreds of thousands of these types of volumes—that's how popular they are in Russia. Through science fiction authors are telling people of the reality of the West."

W. Ritchie Benedict
Calgary 4, Alberta, Canada

Directions:

This is to comment on a brief passage found in Galaxy Bookshelf, July-August, where Mr. Budrys puts forth as a criticism a statement that the theme of the book being examined is "contrasurvival."

His basis is a philosophy alien to his mind because he has become alarmed

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over the old ethics which provided for the merits of an individual's progress and tended to ignore the planet and institutions alike. The new ethics, whether it flies the flag of the green theta of the humanist pseudo-anti-dogmas, on the other hand, puts the planet above the individual.

The end result of the practice of the new ethics, which is idealistic even as viewed by its proponents, is a planet of tense global tribes in a state of moral anarchy. Contrasurvival? It depends upon what we wish to survive—the individual rights to progress under a system of transcendent intuition, or the American Empire's desire to keep from following the natural cyclic recourse which, in the past, left us monuments like the Forum and Stonehenge, which we continue to ignore.

Relativistic morals and humanism were foreseen by one of the greatest (I believe) philosophers of time, Isaiah, when he recorded: "The wisdom of their wise men shall perish and the understanding of their prudent men shall be hid." A "decent" philosopher can't get a word in edgewise these days because of the masters of rhetoric and syllogism like Russell, Huxley and the other contemporaries whose recreation is the manipulation of "reason" themes that promise to save us.

Marc A. Schindler
Calgary 23 Alta., Canada

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Galaxy will pay $10 for a lead letter and $5 each for other letters published in *Directions*. Address correspondence intended for this department to: *Directions*, Galaxy Magazine, 235 E. 45th Street, New York, N.Y. 10017.

ASIMOV'S RETURN—A MAJOR PUBLISHING EVENT!

WE are proud to be able to announce forthcoming publication of Isaac Asimov's first new novel in 16 years, THE GODS THEMSELVES. It will appear in three fascinating installments scheduled as follows:

(1) *Galaxy*, March 1972—on sale January 25.
(2) *If*, April 1972—on sale February 25.
(3) *Galaxy*, May 1972—on sale March 23.

Why this unique arrangement? Well, we found THE GODS THEMSELVES so rewarding and exciting, so special in every way, that we were determined to bring it to our readers somehow. But since *Galaxy* and *If* are now bimonthly, to serialize this astounding novel in just one of them would have meant that we could not beat the deadline set for hardcover publication by Doubleday.

Fortunately, sections 1 and 3 of the novel are quite complete in themselves and closely fit the "hard science" coloration favored by *Galaxy*. On the other hand, section 2 of the novel—told from a different viewpoint—is perfect for the generally more fanciful mood of *If*. Hence, with Dr. Asimov's blessing, we decided to split his new work between the two magazines—thus making sure we get it to s-f readers by the required date and in the proper setting.

If your dealer does not handle one or the other, you can order single copies of either *Galaxy* or *If* directly from us. Similarly, if you subscribe to only one of the magazines, you can order single copies of the other directly from us. We pay postage.

In any event, don't miss this masterpiece of a noval by the great and gifted Isaac Asimov!

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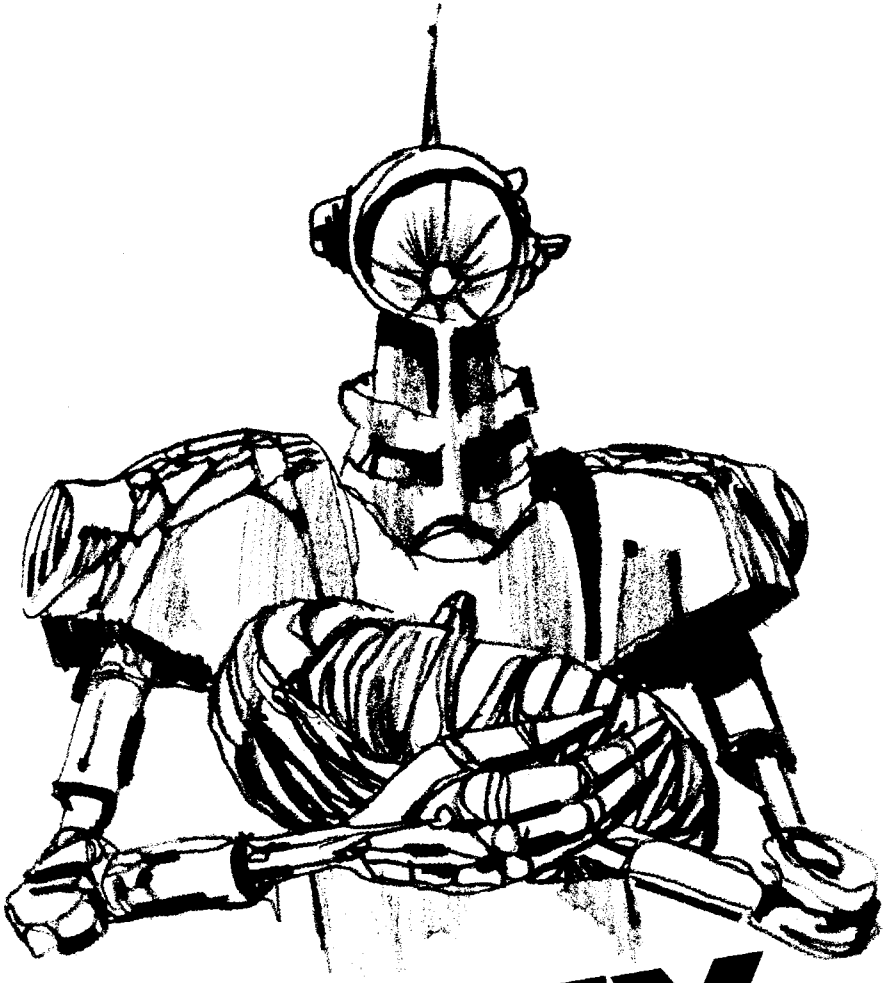

JOEY

F.A. DAVIS

Finally they had a baby—for a while!

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I THINK Joey was the most beautiful baby I ever saw, although I may be prejudiced. At least he wasn't as red and wrinkled as the others in the sterile, robot-manned hospital nursery. For whatever reason, I loved him the moment I saw him; but when the shining, stainless-steel nurse placed him in my arms for the first time, I had a wincing premonition of the agony that would lie ahead for us. Big Joe did, too, for I could see him growing more and more attached to Joey each day and I watched the reluctance in his eyes and the sad lines etching themselves into the corners of his mouth when he would insist on helping me feed and bathe Joey.

Joe and I had only been married five years when we petitioned and were granted permission to have Joey—practically an all-time speed record. But since Joe was one of the top research physicists at the ion-research station in Houston (the old NASA center), I guess Big Uncle-Daddy thought we were good bets. So I was allowed to leave my post, also at the ion-research station, in favor of in-depth homemaker training.

For the most part our first year with Joey was a delight. I loved being a mother. Somehow, by restricting children, old Uncle-Daddy has brought home the point to a lot of us bright working girls that having a baby is more of a privilege than a chore. And I guess that in itself is a good thing. At least you never see neglected, unloved kids like they tell us in school there used to be. One thing for sure, playing with Joey was a lot more fun than calculating rocket velocities and ion stresses and metal fatigue. Even the dirty work was fun after I learned how to change diapers without noticing the smell. And I laughed till I cried the first time Joey anointed Joe in the ear with his immature bladder control as Joe stood by to watch me change the baby. And Joe was never prouder than when Joey first counted to ten, as I measured the drops of his liquid vitamins into his orange juice with my eyes half closed the morning after his first birthday party (which turned into a great party for the adults present after Joey fell asleep).

The months and years raced on. We watched Joey take his first steps. He became the center of our lives and our greatest pleasure. He was always warm and loving. One day he really surprised me—he told Joe what I wanted for my birthday after he overheard me tell my neighbor I was dying for a particular new dress in Neiman Marcus's window. Can you imagine a three-year-old bothering to remember such a thing?

When he was four he had to go to the hospital for a whole week and they wouldn't let us stay with him, just look in for a few minutes in the evening. The house was so

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empty as we walked around in circles and nearly wore out the carpet. Joe was grumpy and short-tempered, the first time I ever saw him lose his easy-going way, and I was so lonesome during the days that I actually sent the android maid out and scrubbed the house myself. Mostly I missed Joey's little arms hugging my legs every few minutes, but the quiet, too, was awful. When he came home we had the greatest celebration you could imagine—home-made cake, ice cream, fried chicken, and a whole day at the zoo!

Then, at five, the first day Joey started school—I'll never forget it—he said to me, "Mama, the teacher said I couldn't play with most of the kids. The experimental models have to play just with each other. Why?"

"Well, because—" I couldn't finish the sentence. I knew I'd have to tell him his life would be short. But I wanted every second of it to be happy— How could I tell him?

When Joe came home he guessed what had happened. After all, we'd known from the beginning it would.

"How about starting to think of a new baby, a re—"

"Don't! Don't say it!" I cut in. "Joey's real! REAL! REAL!!!"

I knew I was screaming but I couldn't help it. I collapsed into awful sobbing and Joe didn't say any more about it, just held me close till I got control of myself

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again. The days and weeks went by and I knew I should bring up the subject myself, having a new baby I mean, because he'd wait until I was ready to talk about it. And I could guess—more than that, I knew for sure—he wanted me to get pregnant as soon as possible. We'd served our five-year apprenticeship course in child-rearing, and we were eligible now, but Joey . . .

Then it happened. We had our birthday celebration for the sixth anniversary of his delivery to us and during the night, like the clockwork he was patterned on, I heard the soft *poof* from his room and knew he was gone. I rose unsteadily like a sleepwalker, trying not to disturb Joe, and walked to his little bed and picked up the few remaining bits of plastic and metal that had been my self-destruct, experimental, parent-training model baby, and wept. ★

ACCIDENTS HAPPEN. Due to a bindery mishap, a small number of IF and GALAXY copies, dated September-October 1971 or November-December 1971, were placed on sale with pages missing or repeated.

If you received one of these defective copies, mail us the cover plus your name and address, and we will send you a proper replacement gratis.

—THE EDITORS

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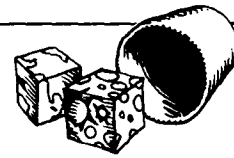

Want to Bet. . . .

. . . On what day is the shortest of the year? The longest?

To answer these questions in full technical detail would require another *Almagest*. Here we shall confine ourselves to fundamentals.

First, what is a day? In common usage the word denotes the interval between sunrise and sunset. In the average latitude of the United States, then, the shortest day would be December 23, when that interval is nine hours and ten minutes.

By the same ground rules the longest day is June 20, when sunrise and sunset are fifteen hours and one minute apart.

For the astronomer, however, the word "day" has a wholly different meaning. To him "day" is the interval between two successive passages of the sun across the observer's meridian—or, loosely, the interval between the times when the sun is highest in the sky.

The astronomical definition turns everything around. Now December 23 becomes the longest day of the year! And September 17 is the shortest! (The difference between these two extremes, incidentally, is only fifty-one seconds—not enough to affect anyone's daily life.)

. . . On the magnitude of the faintest star visible to the naked eye?

Usually the answer is given as magnitude 6. But careful viewing experiments performed against a very black sky have shown that stars of magnitude 8.5—ten times fainter than magnitude 6—can be glimpsed without artifical aid.

. . . On what is the farthest object man can see without a telescope?

It is not generally known that the Andromeda galaxy, M31, under favorable conditions, can be easily glimpsed by averted vision. The distance from Earth to Andromeda, according to the best estimates, is about 2,200,000 light years.

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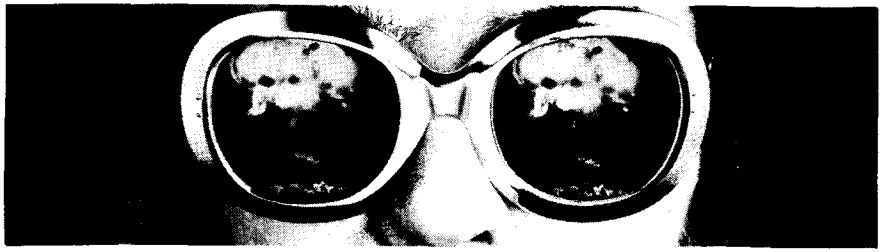

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